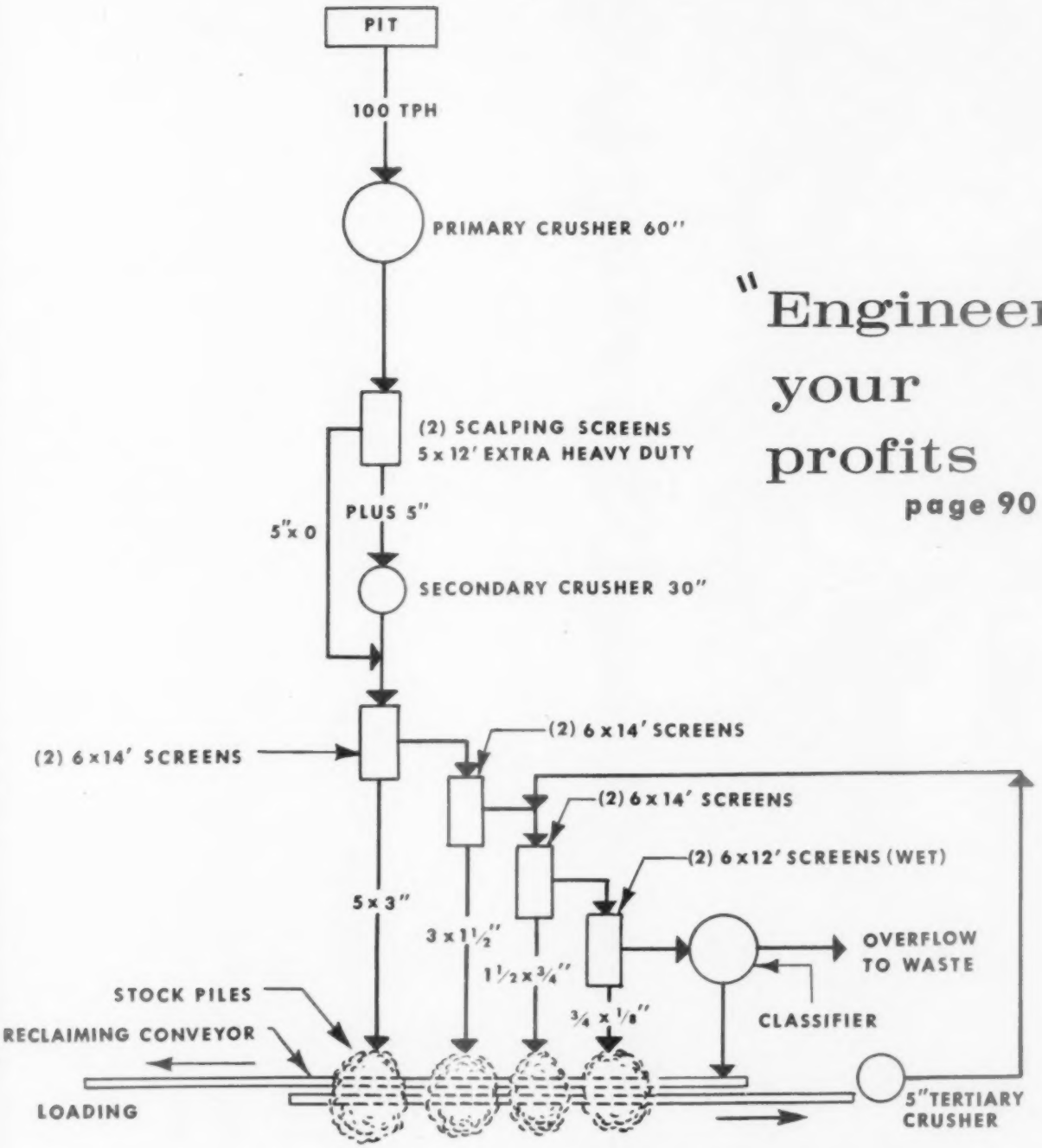
SEPTEMBER • 1960

ROCK PRODUCTS



"Engineer" your profits

page 90

ANNUAL OPERATIONS ISSUE

Higher output on FINE GRINDING..20 to 400 mesh.. with WILLIAMS ROLLER MILLS

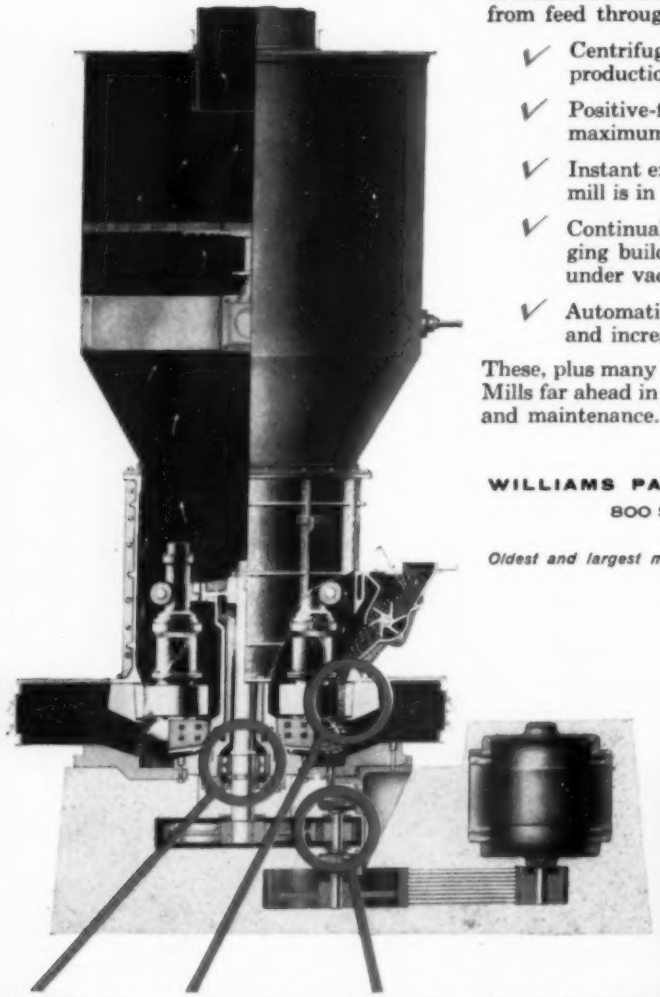
A Williams does the entire job in a single continuous operation—from feed through grinding, blending, drying and classifying!

- ✓ Centrifugal grinding roll action against bull ring keeps production high—automatically compensates for wear
- ✓ Positive-flow feed control is self-adjusting—maintains maximum capacity of mill
- ✓ Instant external fineness adjustment can be made while mill is in motion
- ✓ Continual upward air sweep to classifier prevents clogging build-up of finely ground material. Mill operates under vacuum to insure dustless operation.
- ✓ Automatically controlled hot air is available for drying and increased output of moist material.

These, plus many other advanced features keep Williams Roller Mills far ahead in higher production, lower costs. less downtime and maintenance. *Write for catalog.*

WILLIAMS PATENT CRUSHER & PULVERIZER CO.
800 St. Louis Ave. • St. Louis 6, Mo.

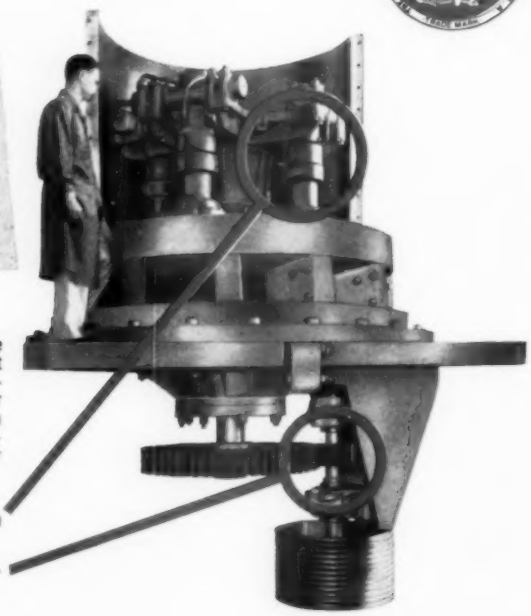
Oldest and largest manufacturers of hammer mills in the world



Troublesome alignment is greatly simplified and far less frequent with only 2 bearings on main shaft; the bottom one carrying both radial and thrust loads.

From here, material pulverized by rollers against bull ring are air-lifted to classifier which passes correctly sized product and returns coarse material for regrinding.

Exclusive! Only Williams has longer-life SPUR GEAR or GEARLESS DRIVES that eliminate expensive bevel and other hard-to-maintain gears. Standard and larger models have rugged spur gear and pinion drive—smaller models have direct motor-to-shaft V-belt drive requiring no care or lubrication.



"Giant" mill with cover section off show roller journals which suspend grinding rolls on bearings sealed against dirt and grit. Note wear-resistant steel forged bull ring.

Housing is also removed to show rugged spur gear and pinion drive. Easy, quick accessibility for service is another Williams time and money-saving feature.

WILLIAMS
CRUSHERS GRINDERS SHREDDERS

Hammer Mills | Helix-Seal Mills | Air Separators | Vibrating Screens | Feeders | Impactors

Enter 1273 on Reader Card

TROUGHED BELT IDLER
Carrying type available with end rolls inclined at 20°, 35° and 45°.

TROUGHED BELT RUBBER CUSHION IDLER
Protects belt from damage by falling, heavy lumps at loading and transfer points.

8500 LINK-BELT idlers perform dependably

on world's longest permanent belt conveyor

Long-term dependability is built into the thousands of idlers in Ideal Cement Company's 5½-mile belt conveyor system. And the same is true of *every* idler Link-Belt turns out.

Rolls are accurately machined to assure concentricity. Frames are exceptionally sturdy with base, brackets and foot straps jig-welded to assure accurate roll alignment. Inverted-angle bases shed material . . . prevent build-up. These features plus effective seals, anti-friction bearings and ease of lubrication add up to dependability today . . . *and for many years to come!*

Link-Belt builds industry's most complete idler line . . . more than 759 types and sizes. Available with end rolls inclined at 20°, 35° and 45° for a broad range of belt widths. For full details, contact your nearest Link-Belt office or authorized stock-carrying distributor. Look under CONVEYORS in the yellow pages of your phone book. Or write for Book 2716.

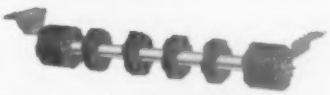
LINK-BELT

BELT CONVEYOR IDLERS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.

TROUGHED BELT-TRAINING IDLER
Automatically trains belt and protects belt edge from wear caused by misalignment.

RETURN BELT IDLER
Supports empty belt on its return run.



RUBBER TREAD RETURN BELT IDLER
Extends belt life by reducing tendency of wet or sticky materials to cling to belt.

BIGGEST HAUL YET IN RAW MATERIALS. Ideal's new 3-million-barrel plant at Ada, Oklahoma, receives 1000 tph of limestone and shale via world's longest permanent belt conveyor system. The quarry is at Lawrence, Okla., 5½ miles away. 15,408

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ROCK PRODUCTS

a Maclean-Hunter publication, Vol. 63, No. 9

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September 1960

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B.F.Goodrich V belt briefs

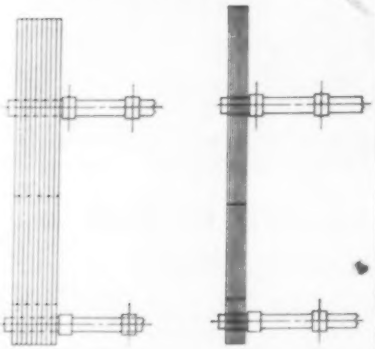
TIPS ON THE CARE, MAINTENANCE AND SELECTION OF V BELTS FOR INDUSTRY

ORDINARY V BELT DRIVE

MAXIPOWER DRIVE

SAVE $402.14 ON V BELT DRIVES—*Costs for* both *sheaves and V belts were cut when B.F. Goodrich Maxipower belts replaced ordinary belts on this drive. Size and weight of sheaves were reduced, smaller and fewer V belts were used*—eight *5V2500 belts replaced* nine *D-240 belts. The result: a $402.14 saving. Costs can be cut as much as 30% by switching to a Maxipower V belt drive.*

How Maxipower V belts reduced bearing load 42%

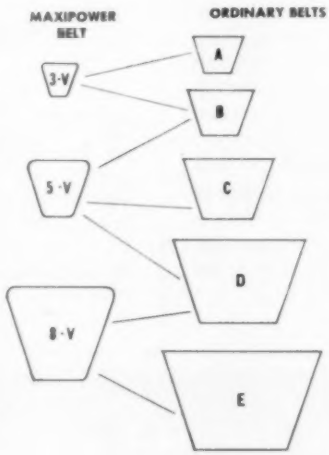


ORDINARY DRIVE MAXIPOWER DRIVE

In the installation shown above, sheaves for the Maxipower drive are lighter, have a face width of only 5 13/16", compared to a 13¼" width for the sheaves on the ordinary drive. Because there's less weight, less shaft overhang, bearing load for this Maxipower drive is 42% less for the driven shaft shown than the drive replaced. This greatly increases bearing life.

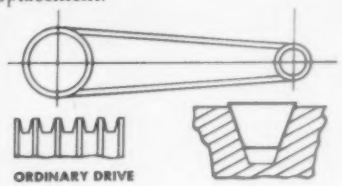
With Maxipower V belts, three cross sections do the work of five

Each cross section of the new B.F. Goodrich Maxipower V belts has been fitted to a particular horsepower range so that only three cross sections are needed instead of the A, B, C, D, and E sections of conventional V belts. The three cross sections are 3V, 5V and 8V.

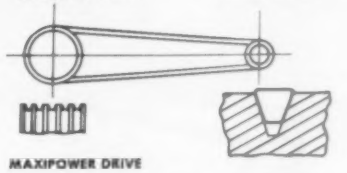


New BFG Maxipower V belts save space, weight, bearings, dollars

New B.F.Goodrich Maxipower V belts give up to three times the horsepower-carrying capacity in the same amount of space as ordinary belts. This more compact drive gives you more horsepower per dollar, results in substantial savings, both in initial costs and often in belt replacement.



ORDINARY DRIVE



MAXIPOWER DRIVE

In most Maxipower installations, fewer belts and smaller diameter sheaves are used, center distances are shorter. Costs can be cut up to 30%, valuable space is saved. Sheaves have narrower grooves and groove spacing, are smaller, less costly. The smallest sheaves that can safely be used with the drive motor can be installed. Often these will be 50% smaller than present drives. This reduced sheave weight and face width means less shaft overhang, less bearing load—increased bearing life.

The extra strength of Maxipower V belts comes from its new rubber compounds, the tough fibers used in its load-carrying cords, and the new "deep V" design. Because of this design the belt's load-carrying cords are supported so completely that each has an equal share in the load—none "loaf".

All Maxipower V belts are heat-resisting, oil-resisting at no extra cost. Belts with static conducting properties can also be ordered *at no extra cost.*

For further information and help in selecting Maxipower belts for your drives, call your B.F.Goodrich distributor. *B.F.Goodrich Industrial Products Company, Dept. M-907, Akron 18, Ohio.*

B.F.Goodrich V belts

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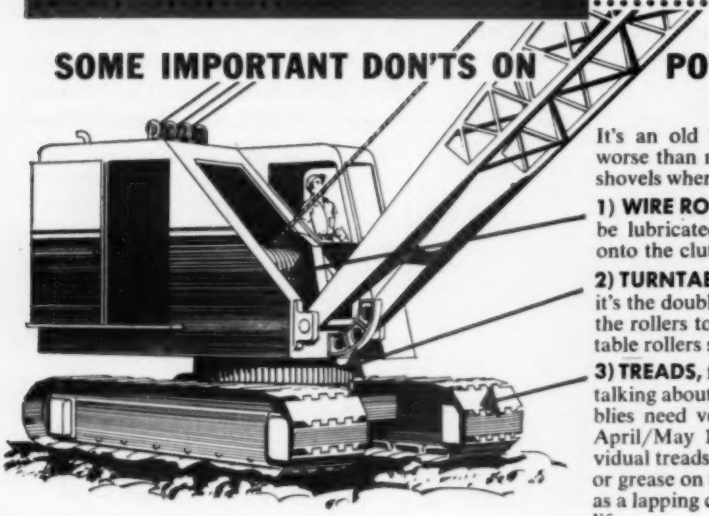
LUBE LOGIC

Three time and money savers

SOME IMPORTANT DON'TS ON POWER SHOVEL LUBRICATION

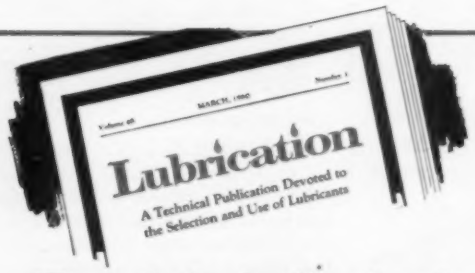


It's an old Texaco maxim that over-lubrication is sometimes worse than none at all, and there are three vital spots on power shovels where this is particularly true:

1) WIRE ROPE that winds onto drums fitted with clutches should be lubricated very sparingly; otherwise, the lubricant may get onto the clutch faces and cause slipping.

2) TURNTABLE ROLLER PATH should never be lubricated, unless it's the double-flange type with hook rollers. Lubricant will cause the rollers to slide and wear flat. Lubricate the bearings of turntable rollers sparingly to avoid drip on the turntable path.

3) TREADS, for instance, should never be lubricated at all. (We're talking about the tread only now; the track rollers or idling assemblies need very different treatment, which we discussed in the April/May 1960 Lube Logic). The pins that connect the individual treads are designed to operate without lubrication. Any oil or grease on these pins will pick up abrasive dirt which would act as a lapping compound on the pins and drastically shorten service life.



The whole truth about mobile lube rigs

What does it take to make a mobile lube rig? What do you put on it? How do you use it? The questions have been coming in so fast lately that Texaco has devoted a whole issue of its magazine, *Lubrication,* to answering them: the March 1960 issue, titled "Mobile Lubrication Equipment."

Lubrication is a major factor in cost control, and lube rigs can be a major factor in thorough maintenance, so send for your free copy of the March *Lubrication.* Supply of these valuable booklets is limited, so if you want one, send in your request *now* to Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Department EM-20.

End-of-shift is best fueling time

They say there's a time and a place for everything, and for refueling your equipment the best time is the end of each day's work. And here are two reasons why: End-of-shift fueling minimizes the possibility of fuel-tank rusting, because there's no room for condensate to form in a tank that's full of fuel. And tank-bottom sediment, stirred up by incoming fuel, has a chance to settle down overnight, so it won't be drawn into the fuel line.

TEXACO LUBRICATION ENGINEERS

If LUBE LOGIC doesn't solve your problems, call your local Texaco man. Anytime, all the time, he's your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control."
Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

Tune In: Texaco Huntley-Brinkley Report, Mon. Through Fri.-NBC-TV

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Throughout the United States
Canada • Latin America • West Africa

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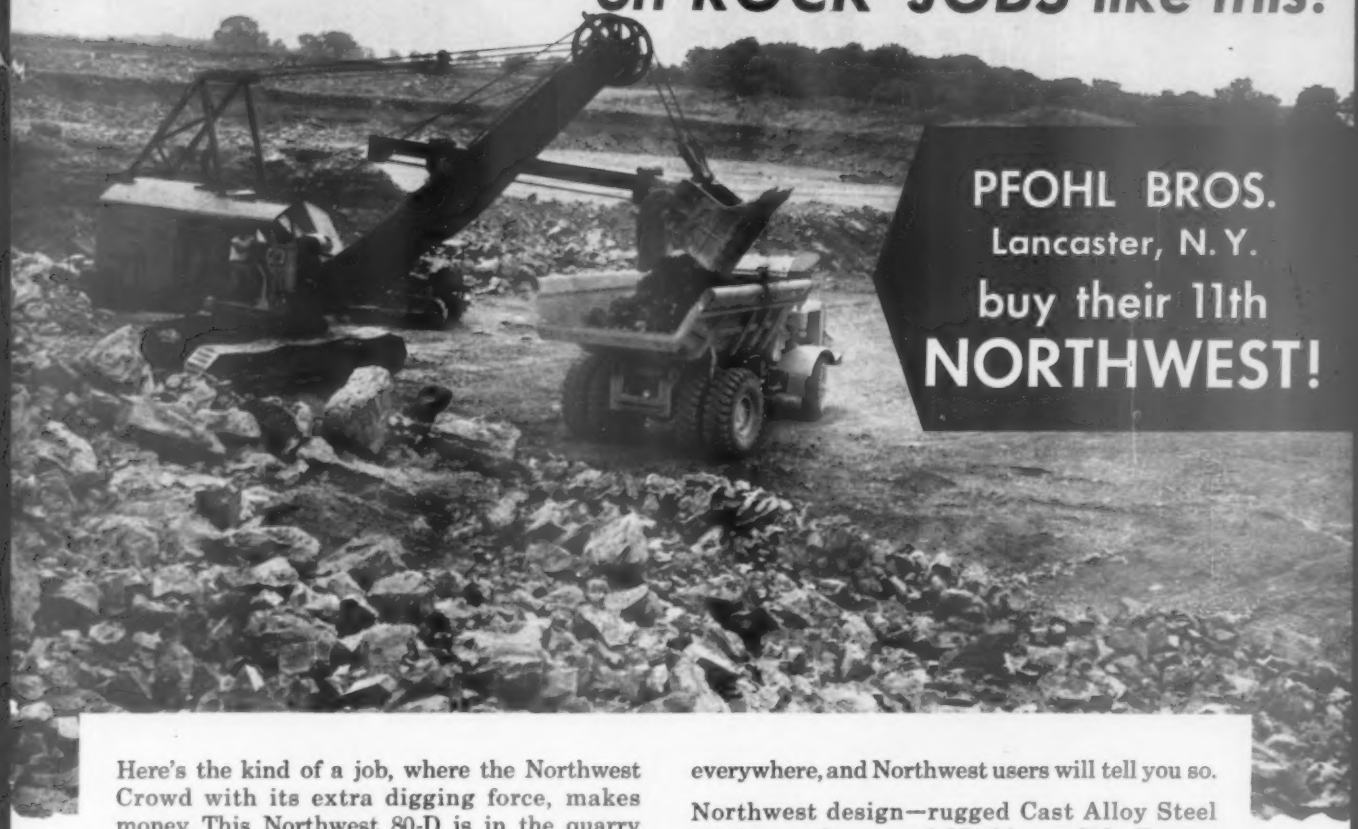
REPEAT ORDERS are born on ROCK JOBS like this!



PFOHL BROS.
Lancaster, N. Y.
buy their 11th
NORTHWEST!

Here's the kind of a job, where the Northwest Crowd with its extra digging force, makes money. This Northwest 80-D is in the quarry of Pfohl Brothers handling limestone at Lancaster, New York.

This 2½ yd. rig and an older 80-D are averaging 6,000 yds. of shot limestone in 8 hrs. Mr. Paul Pfohl says, "We buy Northwests because of their reliability and adaptability. We've had lots of makes and the Northwest is the best. They're built for rock work."

Here again, both from the standpoint of satisfaction with Northwest performance as evidenced by the purchase of 11 Northwests and an owner statement, is testimony to the fact that Northwests are always ready to go. We hear it everywhere, and Northwest users will tell you so.

Northwest design—rugged Cast Alloy Steel Machinery Bases and Machinery Side Frames that eliminate constant rebuilding; Uniform Pressure Swing Clutches, cool-running, jerk-free; the Feather-Touch Clutch Control with its *true* feel of the load; a crowd that brings extra digging force to handling rock, power plants engineered for rock work and many other Northwest advantages combine to give smoother control, greater digging power and longer, trouble-free service.

Your Northwest is always ready to go. If you are considering adding to your equipment it will pay you to bring yourself up-to-date on Northwest latest advantages.

NORTHWEST ENGINEERING COMPANY
135 South La Salle Street, Chicago 3, Illinois
1514 FIELD BUILDING

S-80-114-S

NORTHWEST
Always Ready to GO

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	13-Ton to 60-Ton Capacity	¾ Yd. to 3 Yd. Capacity	¾ Yd. to 2½ Yd. Capacity	25-Ton to 35-Ton Capacity

"My Boss Read the Specs with Tears in His Eyes"

He looked like he'd lost his best friend — money.

"Goodbye contract," he said quietly. "We just can't hope to meet these government specifications for aggregate."

"Yeah, it's pretty hopeless with our set-up. Of course, if we had a hydraulic classifier — " (I was kidding.)

"You're out of your mind. Around here water costs more than sand."

"Well how about an air separator, like Sturtevant makes?" I shot back. "Pete's brother runs a pit at Rapid City and says they clean sand without water. By de-dusting it."

He was skeptical. "Aren't Sturtevants for cement?"

I nodded. "They are, but you see quite a few in aggregates, too, nowadays. Might be worth a try."

The Boss smiled for the first time that morning. "What the heck are you waiting for? Get 'em on the phone and let's see what they can do."

So we got the contract, thanks to the 12 ft. Sturtevant we now use for de-dusting and pre-classification. It's a beaut. Gives good service outdoors the year round, with no protection except for the motor housing.

If you're in this business, Brother, it might pay you to have a good long look at what a Sturtevant can do for tight aggregate specifications.

Sturtevant Air Separators classify production loads up to 150 tph by exact control of air currents and centrifugal force. Simple, quick adjustments make possible the selection (or rejection) of particles in the 30 to 400 mesh range. Nine standard models available, varying in size from 3' to 18'.

Learn how a Sturtevant Air Separator can help your aggregates production. Write today describing your needs. Address: Sturtevant Mill Co., 102 Clayton St., Boston 22, Mass.

STURTEVANT AIR SEPARATORS CLASSIFY SAND WITHOUT WATER

PRODUCING CLEAN SAND, the Sturtevant acts as a de-duster by removing fine mesh particles from the throughput. Particularly valuable where water is limited.

EASING SCREEN LOADS, the Sturtevant rejects unwanted fines and circuits coarser sizes to screens for grading. By this pre-classification, the possibility of blinding screens with fines is minimized and output considerably increased. Also, excessive dust problems are eliminated.

WHEN BLENDING IS NECESSARY, the Sturtevant selects fines from the crushing operation. This stockpiled product then can be used in the blending operation to overcome fineness modulus deficiencies.

GRINDERS
CRUSHERS
PULVERIZERS
MICRON-GRINDERS

STURTEVANT MILL CO.

Dry Processing Equipment

MIXERS
BLENDERS
ELEVATORS
AIR SEPARATORS

The "OPEN-DOOR" to *lower* operating costs over *more* years

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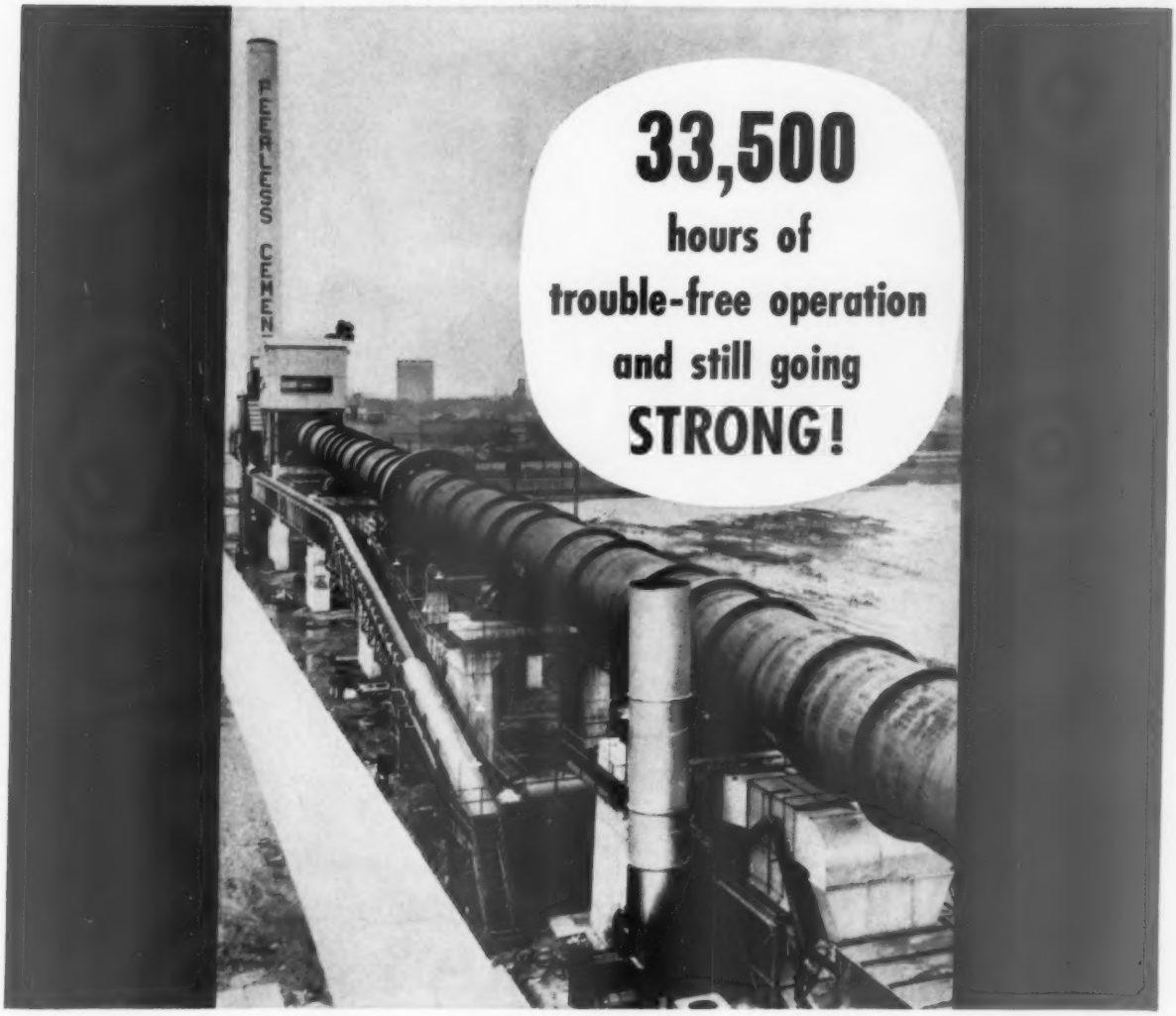

Typical performance of a **TRAYLOR** rotary kiln

Installed in 1956 at the Peerless Cement Company's Brennan Avenue plant, Detroit, Michigan, this 11'6" x 425' kiln has averaged 23 hours of operation a day without costly downtime. Traylor engineers, intimately acquainted with the problems and needs of the cement industry, painstakingly research and design each kiln to do its specific job. That's why Traylor kilns are noted the world over for minimum downtime and maximum years of profitable operation.

Visit Traylor Booth 211 at the Mining Show

TRAYLOR ENGINEERING & MANUFACTURING
DIVISION OF FULLER COMPANY
1557 MILL STREET, ALLENTOWN, PA.
Sales Offices: New York—Chicago—San Francisco
Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P.Q.

TKA-10

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40 STORIES *from Pit to Surface*

...IT'S R/M

CONVEYOR BELT FOR LONG LIFTS!

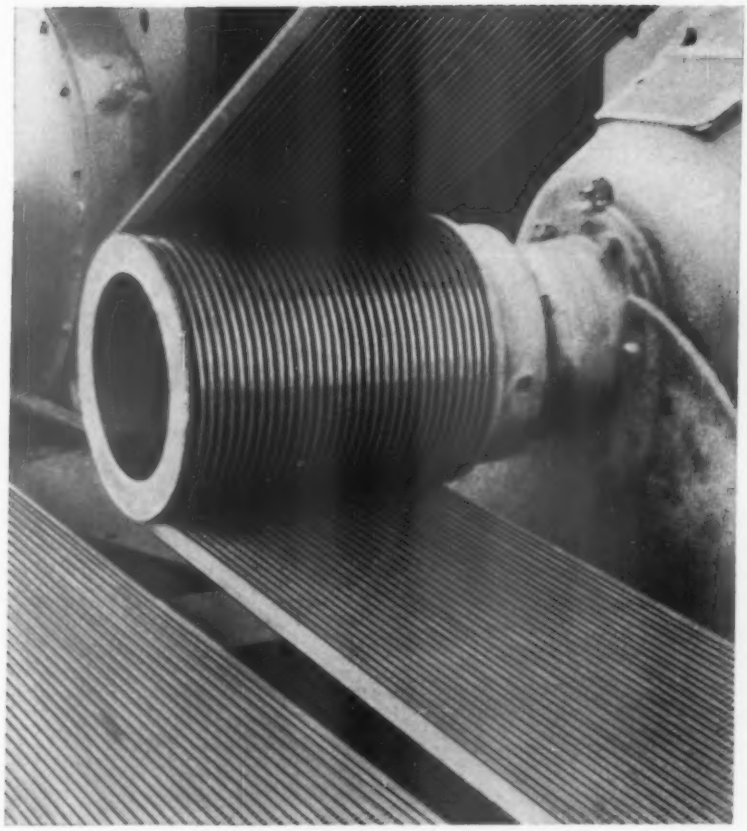
Easy troughability, flexibility, super-strength synthetic cords, high wear-resistance—make R/M Conveyor Belts ideal wherever long lifts at high tensions are required. The installation shown here, for example, was a quarter-mile conveyor with a lift from pit to surface loading station nearly as high as a 40 story building. An R/M conveyor belt made an exceptional record on this rugged haul. There's an R/M heavy duty conveyor belt for every materials handling requirement . . . each engineered to haul fuller, heavier loads—and *last longer*. With proper engineering, for example, you can increase hauling capacity up to 60% with Ray-Man Conveyor Belt and 45° idlers! Ask your R/M representative about other R/M Conveyor and elevator belts, about advantages of extra-flexible, double compensated, rip-resistant Ray-Man . . . about Homocord, the extra-cushioned belt for unusually abusive shock loading conditions, or about the Wedlok metal fastener splice which avoids vulcanizing splices. Any R/M Conveyor Belt with "XDC" cover means extraordinary resistance to wear and tear, longer life—"More Use per Dollar." Write for Bulletin M302 and Catalog CB25.

ENGINEERED RUBBER PRODUCTS ..."MORE USE PER DOLLAR"

RM1018

RAYBESTOS-MANHATTAN, INC.

MANHATTAN RUBBER DIVISION, PASSAIC, NEW JERSEY



R/M POLY-V® DRIVE

More Power—

in Less Space

. . . with Reliability

A *single unit* V-ribbed belt across full width of the drive-sheave—*not* an assembly of V-belts—enables patented Poly-V to deliver much *more* power in the same space as a V-drive . . . or *equal* power in much *less* space! Single unit belt design also eliminates belt "length matching" problems . . . minimizes equipment down-time and belt replacement costs. Belt speed ratios remain constant from *no* load to *full* load to provide the smoothest running, coolest running—*longest wearing* drive you can install. Maintain groove shape. Just two sections of Poly-V Belt meet every heavy duty power transmission requirement. Write for Bulletin M141, or call your R/M Distributor.

CONVERT TO RM POLY-V and BE SURE!

HOMOFLEX HOSE

more flexible, weighs less than any hose for equal pressure

- SUPER-STRONG
- PRECISION BUILT
- NO PRE-SET TWIST—WILL NOT KINK
- INSEPARABLE TUBE-TO-COVER BOND
- UNIFORM INSIDE AND OUTSIDE DIAMETERS
- EASIER, SAFER COUPLING

Strong, lightweight, and "flexible as a rope"—Homoflex is the easiest handling hose and lasts longer. Made in types for air, water, other fluids and gases. Ask about other types of R/M rubber hose for your job applications. Write for Bulletins M620 and M694.

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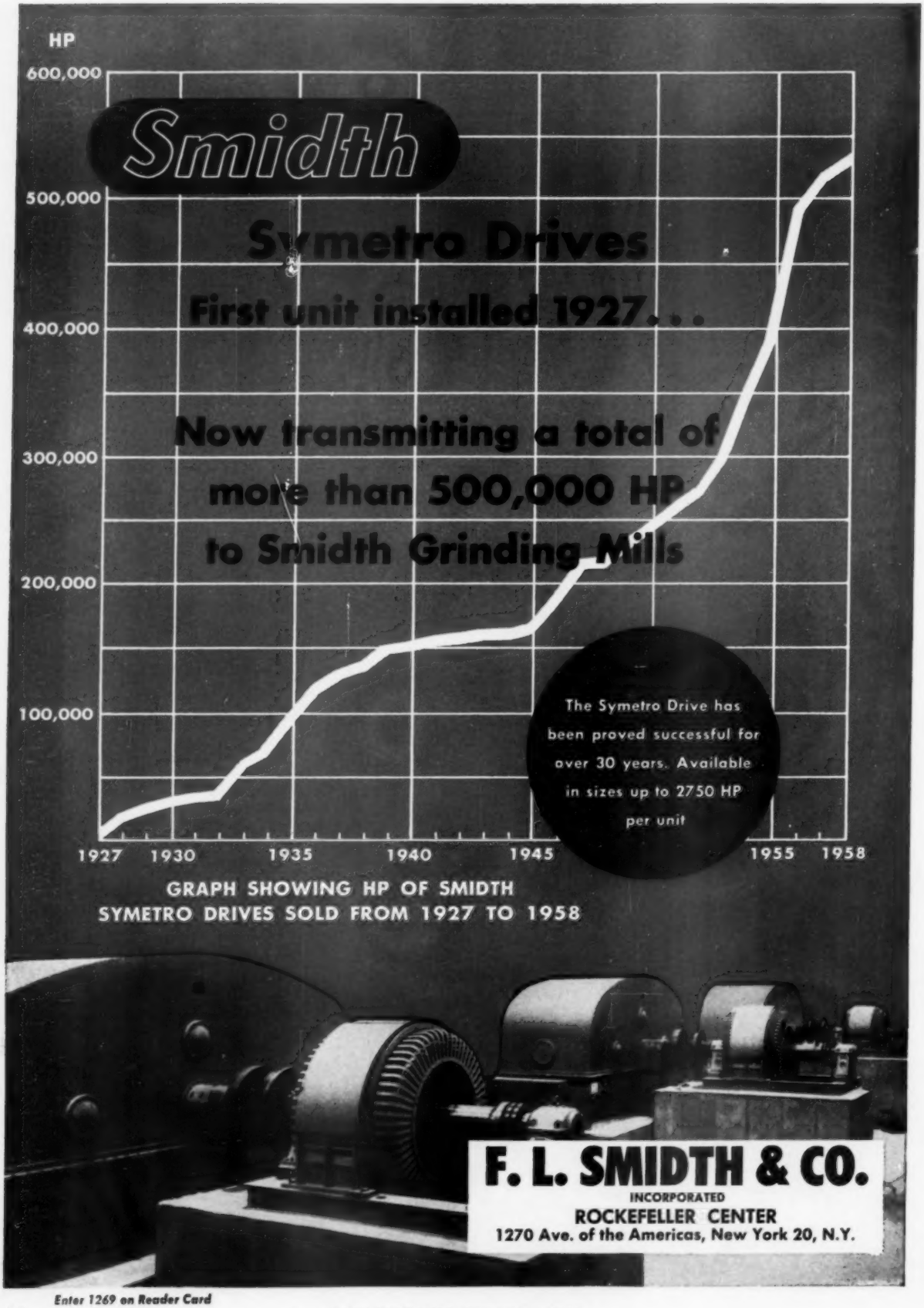

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WHAT'S HAPPENING

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

Bureau of Mines researchers are looking for ways to force new oil yields from old Appalachian fields. And they may have one in the thermal technique, known as in-situ combustion. It involves igniting part of the oil in an underground reservoir, usually with an electrical device lowered into a well. The resulting fire, supported by air pumped into the well, thins the oil and helps drive it toward a producing well. If successful in the field, the process would mean a substantial increase in the country's recoverable petroleum reserves—more than 2 billion bbl. is estimated to be trapped in the Appalachian formations. On a nationwide basis, about two-thirds of all the petroleum discovered remains underground for lack of an economic production method.

A collapsible, rubber-coated fabric bag designed to transport liquids—anything from milk to printer's ink—is Goodyear's answer to the problem of the "dead-head" run. Empty trucks that have delivered their loads of dry freight can, with the new Van Tanks, carry liquid cargoes on their return trips. Or, they could switch the routine, carrying liquid one way and dry freight back. Perhaps it would be feasible to add free-flowing bulk cement to the list of commodities the tanks can carry. The largest of the three sizes could hold about 150 bbl.

Construction put in place during June was valued at $4.9 billion. This was seven percent above May, but represented a smaller than usual May-June increase. Breaking down the total, public construction accounted for $1.5 billion, and private construction for $3.4 billion. The figures brought total construction for the first six months of 1960 to $24.5 billion, three percent below the comparable period of 1959.

Whitewashing a roof can lower its temperature. With a nod to this specialized market, National Lime Association reprinted an article from Consumer Bulletin. The magazine suggested that a coating of lime and white cement would be a better buy than expensive heat-reflection paints for both built-up and asphalt-shingle roofs, and would reduce air-conditioning costs. Giving NLA's recommended mixture of lime and cement, the Consumer Bulletin advised, "It may be well worth trying."

A surface treatment to keep dimension limestone impenetrable by water or dirt has been announced by Indiana Limestone Development, Inc., a subsidiary of Indiana Limestone Institute. The product "Permaclear," has been tested for two years and now will be sold to stone producers for application to stone during the production stages. The substance is colorless and invisible; it penetrates the stone and bonds with it, said Sture Pierson, executive director of the Institute.

Hydraulic dredging is the way to mine a deep-sea deposit of phosphate rock lying on the ocean floor off the coast of California. So says John L. Mero, whose paper was abstracted by Engineering and Mining Journal. He thinks the Forty Mile Bank deposit—under 600 ft. of water 40 miles west of San Diego—is particularly favorable from a mining standpoint. In all, the offshore deposits run into the hundreds of millions of tons, and the tricalcium phosphate ore averages 29 percent P_2O_5. To produce 400,000 tpy., a capital investment of $4.5 million would be needed, he said. Yearly return would be 39 percent, after taxes. Because transportation costs would be low, these deposits may be commercial to mine in order to supply the California industries which must import all their phosphate rock.

Gluing of extensions onto precast, prestressed concrete piles with an isothermic polyester resin has been reported by Concrete Products. The magazine relates that, when used in England, the material was tested successfully for both compressive and tensile strengths. The plastic jointing material takes 15 min. to harden; it is supplied as a resinous liquid and a powder that are mixed immediately before using. By varying the grade of powder used, it is possible to achieve compressive strengths up to 20,000 psi. and tensile strengths up to 10,000 psi.

Is an engineer a scientist? Some confusion surrounds the terms. There are those who call engineering applied science and those who make a careful distinction between engineers and scientists. To clarify the issue, here is an opinion from Dean William L. Everitt of the University of Illinois and president of the Engineers' Council for Professional Development: Science is analysis, determing what follows from interaction of materials and forces; engineering is synthesis, determing the proper combination of forces and materials to accomplish a desired result.

Chemically produced gypsum, not rock, will be used in wallboard manufacture by Allied Chemical Corp.'s Barrett Division at Claymont, Del. The gypsum is a by-product of wet-process phosphoric acid manufacture, and is chemically the same as that obtained from ore. Barrett has developed a purification process that permits utilization of the by-product gypsum; the amount used by the new plant will be equivalent of 85,000 tons of gypsum ore per year.

Oil shale research was successful every way but economically, so the project was abandoned. Union Oil Co. has extracted as much as 26 gal. of oil per ton of shale in its pilot plant near Grand Valley, Colo. However, the plant will be dismantled because, to quote A. C. Stewart, vice president, "The present depressed price of crude oil and the tax picture are such as to make the process uneconomic at this time."

Slag aggregate from power plant boilers will be used in an asphalt hot-mix plant at Rockdale, Texas. The aggregate, a by-product of lignite used as fuel by Texas Power & Light Co., is thus getting its first commercial application. It caps years of research by the utility and Aluminum Co. of America, which has a plant at Rockdale. Another of their projects is extraction of tar from lignite, still in the pilot-plant stage.

THERE'S NO EASIER DRILL TO RUN THAN A REICHdrill!

This smooth operating, all-hydraulic rotary rig is helping REICHdrillers set higher footage records.

In blast holing, prospecting and coring, there's no easier drill to run than a REICHdrill. And the key to money making drilling records is a simplified *control "console"*. From it, every move required by the driller . . . every decision he makes . . . is converted smoothly, instantly, by the all-hydraulic system, into positive, time-saving performance.

Hydraulic drive to drill stem eliminates power loss . . . transmission troubles . . . kelly and rotary table.

Vari-speed Hydraulic Drill Control gives the operator the right combination of rotary speed and feed pressure for every formation . . . leveling jacks, mast raising cylinder and barrel loader are hydraulic too!

Other features: fast, easy set-ups; masts incline for angle drilling; CP heavy-duty compressors; CP Air-Blast Bits for extra footage in toughest formations. *You get more from your rotary when it's a* REICH*drill!*

C-650 crawler mounted REICHdrill set-up for angle drilling. Hole size; to 7-7/8"; down-pressure: to 30,000 pounds. Other models available, truck or crawler mounted, with hole sizes to 16", down-pressure to 90,000 pounds.

For further information write:

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Positioned at control "console", REICHdriller has every rig maneuver in sight . . . every rig control in reach.

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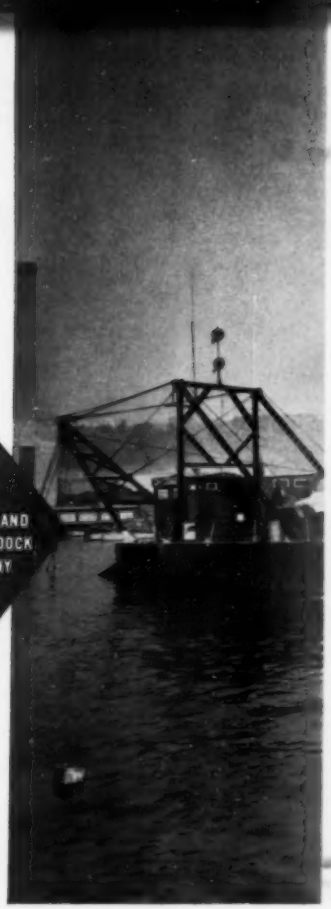
AT NEW ENGLAND DREDGE & DOCK COMPANY



On the dredge C. H. Cobb, operated by New England Dredge & Dock Co., the Amsco 12″ Form 50 S3B pump shown at right is "on duty" 24 hours a day, 6 days a week. It handles 5000 yards a day, pumps discharge over 3 miles with one booster... under 23 railroad tracks, through a mile-long railroad tunnel and through cliffs to a marshland.

Regarding this Amsco pump, installed 2½ years ago, Mr. C. H. Cobb, General Superintendent says—"Its performance and price make this the most desirable pump on the market".

JAW PLATES REDESIGNED IN AMSCO ALLOY...TONNAGE UPPED 75%

AT STAR ROCK PRODUCTS COMPANY

At Star Rock Products Co., Anaheim, California, crusher jaw plates previously used were giving only about 6 months' service. Large rocks dropped into the crusher often caused the jaw plates to "give" enough so the rocks wouldn't crush. Jams and costly delays resulted. Plates would often flow and crack.

Amsco collaborated on a redesign, using 2% chrome (Amsco MY) alloy. After 6 months' service, the plates were in excellent condition. Jams and delays have been eliminated, and tonnage handled *increased 75%*.

AMSCO

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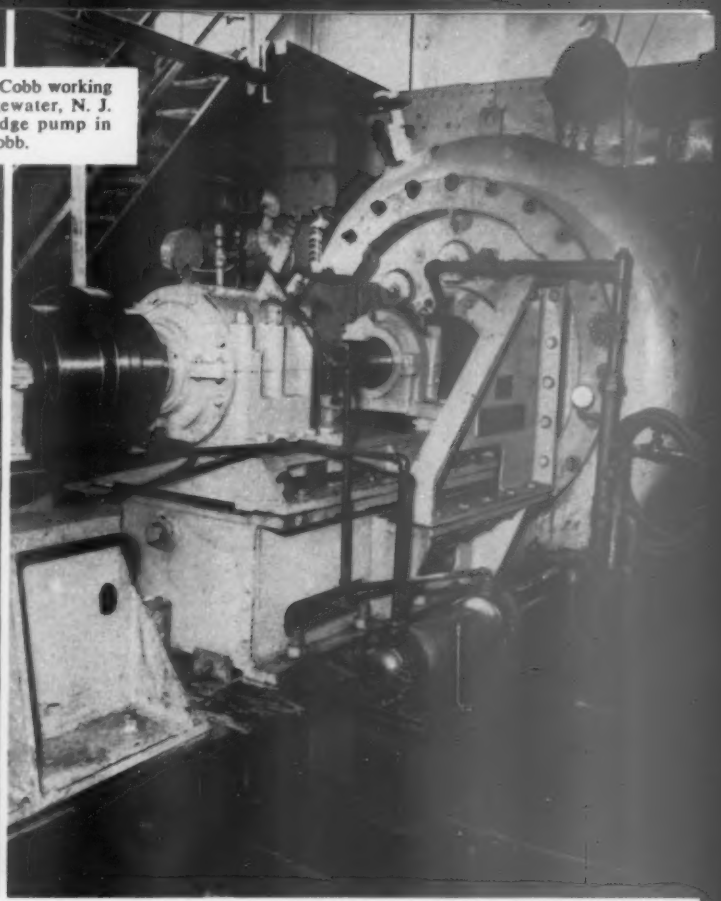

Left: View of dredge C. H. Cobb working around dock area in Edgewater, N. J. *Right:* Amsco 50 S3B dredge pump in pump room on the C. H. Cobb.

Left: General view of Star Rock Products plant at Anaheim, California. *Right:* View of Straub 20 x 36 crusher at Star Rock Products. Rocks up to 18" may pass through grizzly and outer crusher.

NOTES FROM THE PUBLISHER

September, 1960

Dear Reader:

All kinds of benefits accrue to the producer with a good product...prestige, pleased customers, bigger orders and profits. In these days when competitive pricing is offering a serious threat in many areas, you've got to KNOW where you stand and have a realistic knowledge of where you are headed. You've got to take a long, searching look at the many factors that make profits dribble away: service costs, difficulty in getting replacement parts, slow deliveries, inventories.

Profit is the oldest motive in the world of selling—and the newest. Youngsters in the rock products industries have never tussled with a buyer's market or a rash of price-cutting, but the oldsters will tell you they never sold so much for so small a percentage return. Producers both need and want help in finding equipment that will give them a chance to turn an extra penny—get extra production out of every manhour and every square foot of turned earth.

More manufacturers than ever before are rolling up their sleeves and getting right into the problems that you face every day. They know what payload means to you, what it means to maintain service on the costly equipment you buy. They are involved in the hassle of producing-at-a-profit.

The manufacturers who advertise in ROCK PRODUCTS are among the finest makers of heavy machinery in the world. Read their messages and write to them for information and help. It is through you—your complaints and praises—that they are able to get to the bone of your problem and begin the search for solution.

Sincerely,

Philip D. Allen

Philip D. Allen
Publisher

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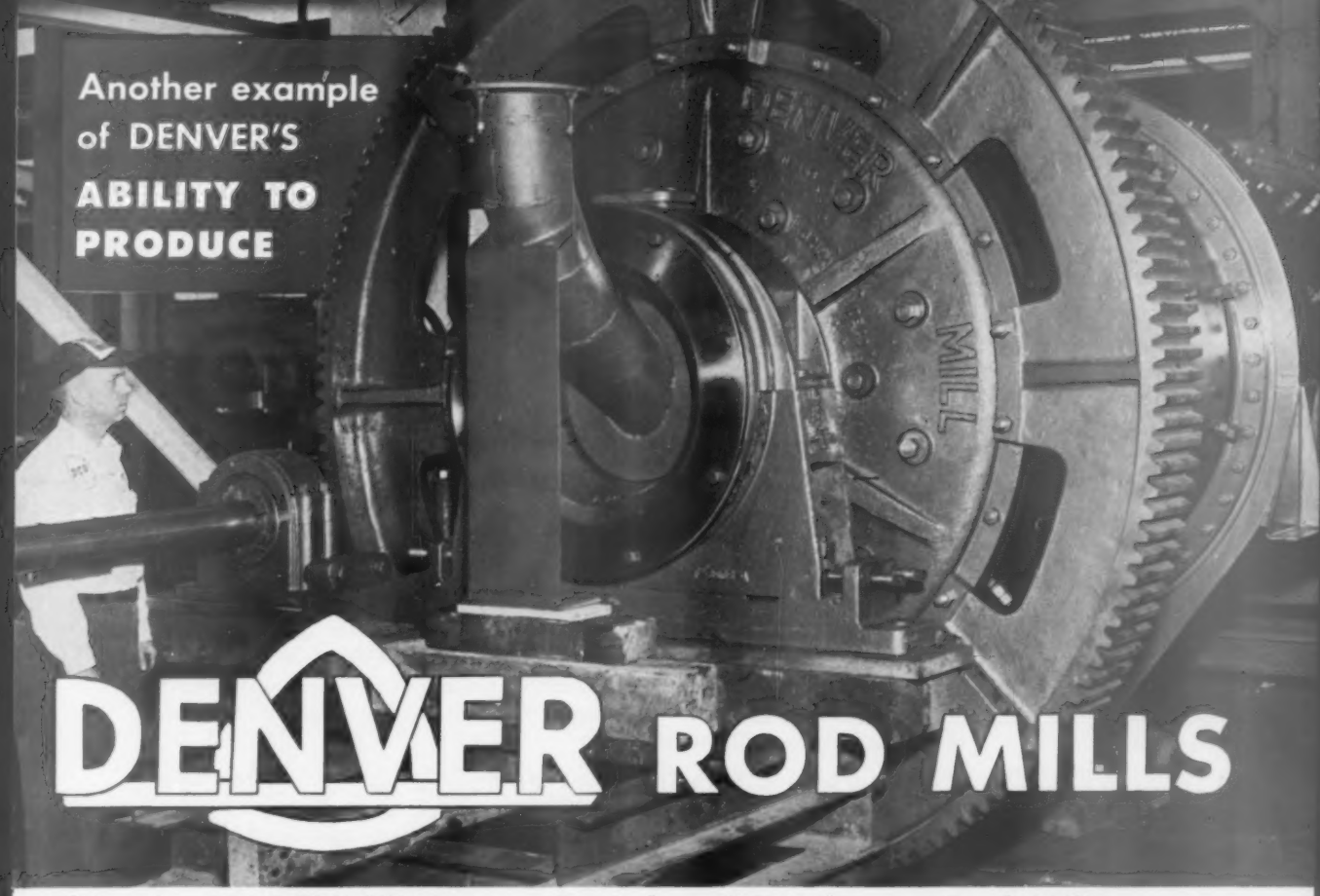


DENVER ROD MILLS

This 5' x 12' DENVER Center Peripheral Discharge Rod Mill was *Completed and Shipped in Just 56 Days!*

Merritt-Chapman & Scott, Construction Engineers, needed delivery of this 5' x 12' center peripheral discharge rod mill in *eight weeks*. The order was received on October 29, 1959. The complete mill—with liners, V-belt drive motor, motor control and 40,000 pound grinding charge—was shipped *just 56 days later* on December 24. And, despite the holidays, the mill was delivered at its West Coast destination on December 30.

DENVER has the know-how, the skills, the experience and the facilities to produce—not only ball and rod mills, but a complete line of top-quality mill equipment—*quickly* and at *lowest initial cost!*

Whether or not speed of delivery is critical, we invite your inquiry on your equipment needs.

Preliminary Grinding Tests Without Charge

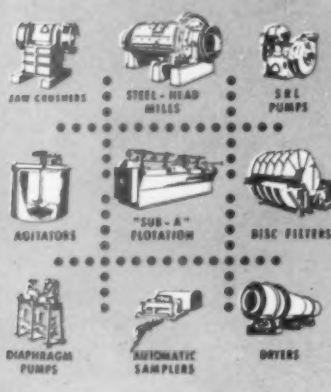
Find out the exact size of mill you require, mill cost, power requirements, mill production and proper size of auxiliary equipment.

Send ¼ yd. sample of material prepaid to

DENVER TESTING LABORATORY
1755 Blake St., Denver, Colorado

NO OBLIGATION!

Mill sizes (up to 10' dia. by 20' long) and type best suited for your grinding needs are described in Bulletin No. B2-B20.



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EDITORIAL

by GEORGE C. LINDSAY

What's your equipment policy?

EVERY COMPANY SHOULD HAVE A POLICY of equipment replacement. Chances are that you think your company has a pretty good one, if one exists. If it doesn't, it should. But, assuming there is one, how good is it, really?

One expert believes that the way an executive or company decides on the replaceability of productive equipment hasn't changed much in a century. That's a startling statement. But it isn't as much an indictment of present-day management as it is a revelation of the fact that this field of management has been woefully neglected.

It's hard to explain why this important phase of management has been slighted. It's especially hard since techniques of cost accounting, production control, procurement scheduling, quality control, sales promotion and a host of others have experienced phenomenal improvement.

One explanation is that, since ability to analyze re-equipment proposals hasn't developed much in 100 years, the method was always good and perhaps approached perfection. Another is that techniques of replacement have been handed down from one generation of managers to another as industrial folklore.

The latter explanation seems more logical. Mr. George Terborgh says, in his booklet on An Introduction To Equipment Analysis: "Replacement is a haphazard, catch-as-catch-can affair, inadequately organized and inadequately informed." For proof of his opinion, he asks management to test itself with these questions:

(1) Do you have a comprehensive knowledge of presently available opportunities for investment in the improvement and expansion of your operations?

(2) Do you have a reliable technique for appraising these opportunities and ranking them in order of profitability or urgency?

(3) Do you know what assumptions as to the future are made in these appraisals?

(4) Do you have an organizational setup that keeps you continuously and fully informed of new investment opportunities?

You have a basis for a good equipment policy if you can tag each of the questions with a "yes" answer. If the answer is "no" to any of them, you have a serious problem.

Better check on your equipment policy now, and set wheels in motion to make more future profits for you or your company.

IN FLORIDA, LEHIGH PORTLAND ZEROS IN ON ELECTRICAL SYSTEM RELIABILITY, SAFETY, LOW MAINTENANCE

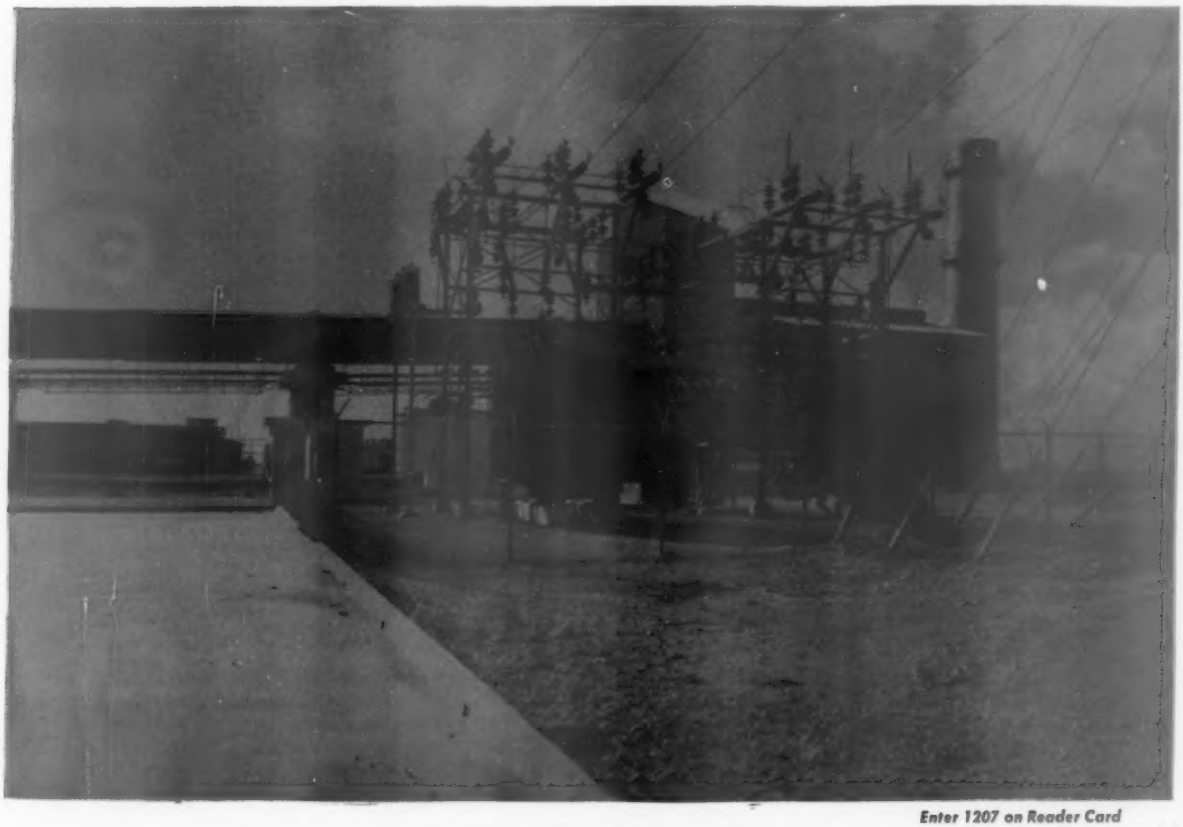
ZEROS IN

When the Lehigh Portland Cement Company built its new plant about five miles west of the Miami city limits, prime considerations for the plant's electrical system were maximum reliability, personnel safety and low maintenance.

Careful planning and selection of Westinghouse equipment scored a bull's-eye. For details on how Lehigh Portland achieved these objectives . . . turn the page.

Westinghouse

POWER FOR PRODUCTION at Lehigh Portland's new Miami plant is supplied by this main 15,000-kva double-ended substation located outdoors. It is double-ended for easier maintenance without a power outage, and located on the windward side for less flashover. This design gives greater flexibility and reliability. Some advantages are periodic insulator and bushing cleaning, no load tap changing, reduced capacity operation . . . all without a power outage. Like most electrical equipment in the plant, substation has provision for extra capacity, will accommodate 18,750 kva.



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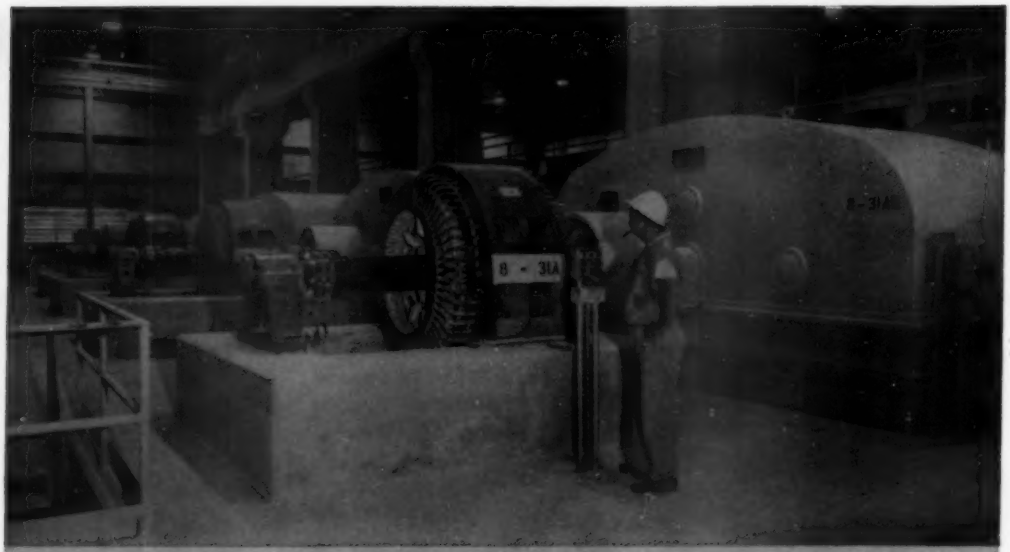
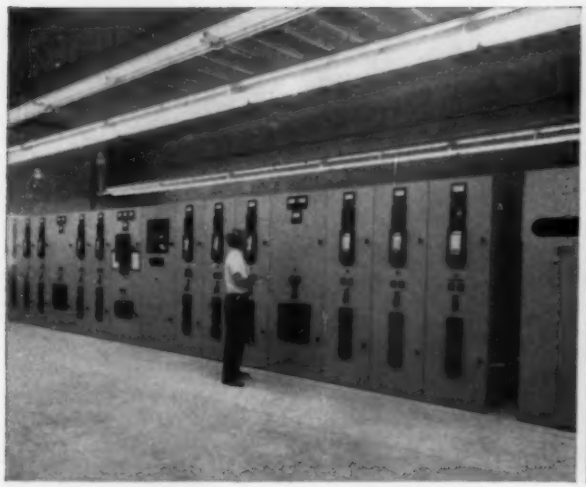
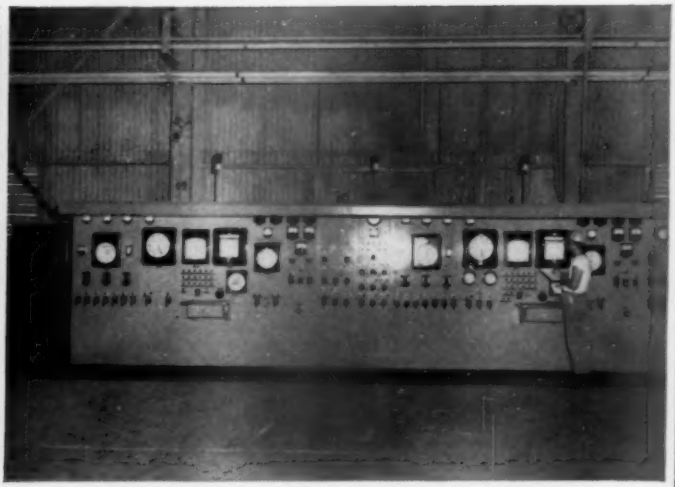
HERE'S HOW LEHIGH PORTLAND HIT



SYNCHRONOUS, COUPLED-TYPE MOTORS driving the Lehigh plant ball mill help assure top production. Thermalastic® insulation, with neoprene coating, offers a dimensionally stable, resilient insulation unaffected by wet and abrasive atmospheres. Saturable reactor control eases the motor into the gear train to bring the mills up to speed.



SIMPLICITY, RELIABILITY, LOW COST are big benefits of plant's radial distribution system using metal-clad switchgear with protective Type DH drawout air circuit breakers. Switchgear permits independent operation of plant departments, facilitates metering. Indoor switchgear is used in this plant.



CONTINUOUS CHECK on performance is maintained with Westinghouse recording and indicating instruments on many phases of plant's automatic operation. These sensitive instruments keep production records accurate and help plant personnel hold production at maximum output without overloading the equipment.

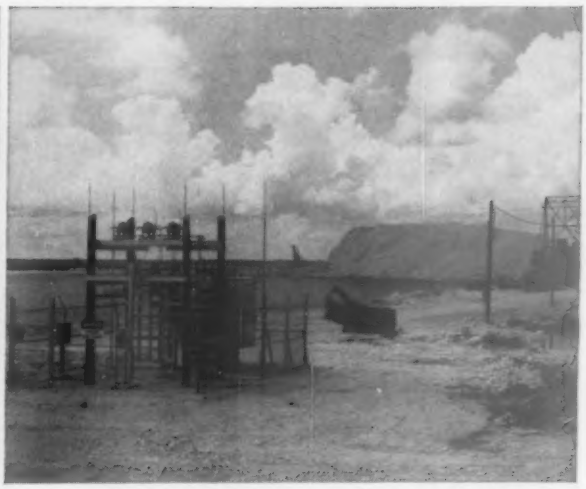
ELECTRICAL GOALS WITH WESTINGHOUSE

At its Miami site, Lehigh Portland Cement Company has built a highly modern plant to effect economies in cement production. Helping to bring about these economies are the reliability, safety and low maintenance of the plant's electrical system. Here are some of the ways in which Westinghouse planning and equipment achieved these system goals:

- All equipment was selected to provide adequate, uninterrupted service for today, yet provide for easy, economical expansion to meet future demands.
- Westinghouse indicating and recording instruments are used in the plant for on-the-spot checks of processes.
- The Everglades site is located in a humid area and was under water most of the year. Even when the plant grade was raised, water seepage could cause damage to the underground electrical system. The design of Westinghouse equipment, special watertight manholes and rigid steel duct encased in concrete overcame this difficult problem.
- A simple, radial system distributes power from the main substation to the plant's operating departments. Small, low-cost power centers located at load concentrations achieve lower voltage drop, less power loss, more flexibility and greater reliability.
- Maximum protection for personnel and equipment at the quarry is provided by special system grounding precautions.
- The outdoor substation proved more economical than one indoors or under a roof.
- Distribution voltage for the plant is 4160 volts, making possible savings in initial cost.
- Voltage drop during starting of the 1250-hp ball mill motors—the most severe system requirement—is estimated to be only 5.6%, which minimizes the malfunctioning of this and other electrical equipment.

Westinghouse

OPERATING RELIABILITY is possible with small, economical indoor Inerteen® Power Centers installed in clean, pressurized rooms. Location at load concentrations minimizes voltage drop and losses.



MAXIMUM PROTECTION is afforded personnel and equipment in the rock quarry by use of safety-resistance grounded systems. Portable switch houses immediately isolate faulted cable and equipment.

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HOW LEHIGH PORTLAND HIT ITS GOALS (*continued*)

The down-the-line planning and careful coordination of equipment that went into the Lehigh Miami plant are basic to the Westinghouse approach to electrical equipment for top cement production. For more information, call your nearby Westinghouse representative today . . . or write Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pa. You can be sure . . . if it's Westinghouse. J-96149

Westinghouse

RELIABLE, FINE CONTROL is provided by Westinghouse equipment for this overhead traveling crane using an adjustable voltage, direct-current bucket drive. Westinghouse control helps keep raw materials flowing through the plant smoothly.

AUXILIARY POWER generated by a 438-kva, 0.8 p-f diesel generator. This unit can tie in to supply critical loads, such as air compressors and lighting, subsequent to a power failure.

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ROCKY'S NOTES

by NATHAN C. ROCKWOOD

Colloid chemistry can do more for cement and concrete

FOR A CENTURY, MORE OR LESS, chemists and engineers have tried to solve problems involving the nature of portland cement, mortar and concrete by use of facts and theories of inorganic chemistry—a branch of what is now termed "classical chemistry." Classical chemistry deals with atoms, ions and molecules, and its continuous development has led to tremendous new and useful knowledge; but it does not solve the problems of many practical applications of chemistry, one being the hydration and hardening of portland cement and concrete.

Although it was pointed out more than 40 years ago that hydrated portland cement is a colloidal material, scant research has been based on this fact until comparatively recent years. T. C. Powers and co-workers in the Portland Cement Association laboratories have done considerable work on portland cement paste as a colloid, but this has to do more with physical phases of the colloid, such as water retention and porosity characteristics, rather than chemical-reactive characteristics. G. M. Bruere, of the Division of Industrial Chemistry, Commonwealth Scientific & Industrial Research Organization, Australia, is another who is applying colloid chemistry to research in cement and concrete, as we shall show farther on.

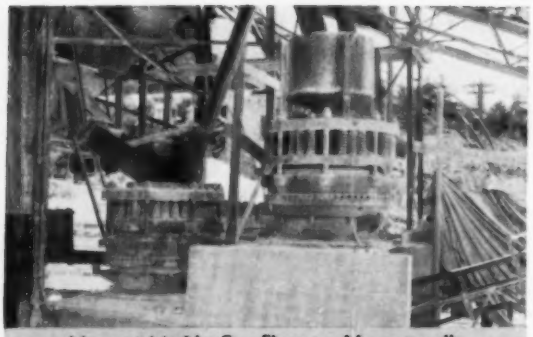
Colloid chemistry as a separate science is relatively new, and probably not too many of the engineers and chemists in the cement and concrete industries have a working knowledge of it. Yet it is important to an understanding of research work now being done by the PCA and elsewhere, as well as to a correct interpretation of practical problems involved in the use of concrete. About the best source of gaining such a knowledge of colloid chemistry that we have discovered is a new textbook: "Introduction to Colloid Chemistry,"* by Karol J. Mysels, University of Southern California. The text is specifically intended for such readers: "the industrial chemist or executive who desires a coherent and concise survey of a field neglected in his academic career."

It must be remembered that colloid chemistry covers a wide variety of materials and manufacturing processes, and the cement or concrete investigator will not find very much specifically relating to his special problems. However, the theory and established principles of colloid chemistry are the same regardless of their special applications, and these are what the student must learn. The field covered is best defined by the author himself: "Whereas the small particles [atoms, ions and molecules] are the subject of classical chemistry, the macroscopic [visible to the eye] steel balls and flexible ropes are properly in the realm of physics. But there is an intermediate range where particles are small enough to give solutions, but large enough for particle weight to range from tens of thousands to billions." These colloidal particles, like atoms, ions and molecules, have electrical charges and can form bonds with each other, or repulse each other, as do atoms or ions in gases and solutions.

The "classical chemistry" explanation of the hydration of portland cement is that the lime and silica chemically dissolve (as ions) and deposit a precipitate—a combined calcium silicate. There is no question about a so-called calcium silicate being formed, but if done according to the theory of classical chemistry, it would be an exceedingly slow process for both SiO_2 and $Ca(OH)_2$ are almost (practically) insoluble in water. What is termed a supersaturated lime solution that is formed is really probably more nearly a "milk of lime," or a suspension of fine grains of hydrated lime in water. In other words it is a colloidal suspension, or solution, rather than a true chemical (ionic) solution, except to a very small degree. The finely divided silica probably acquires, first, a surface of

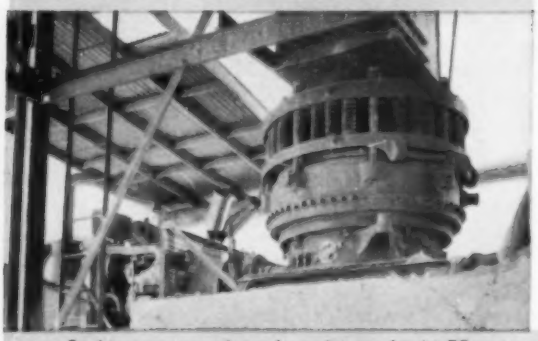
Please turn to page 150

*Interscience Publishers, Inc., 1959, 250 Fifth Ave., New York 1, N.Y., price $10

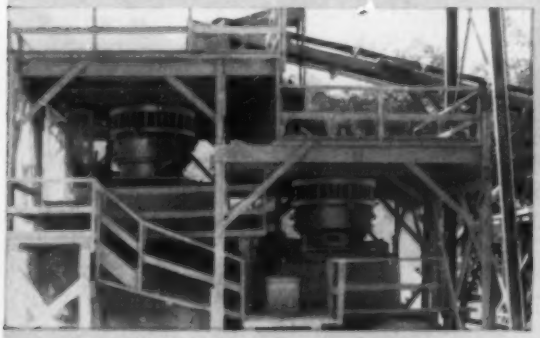


Vermont Marble Co., Florence, Vt., are well satisfied with their 36-S and 36-FC Gyraspheres.

This 48-S Gyrasphere turns out top tonnage for International Lime & Stone Co., Chazy, N. Y.



Crushing granite at Lunenburg, Mass., this 36-FC Gyrasphere is doing a fine job for P. J. Keating.



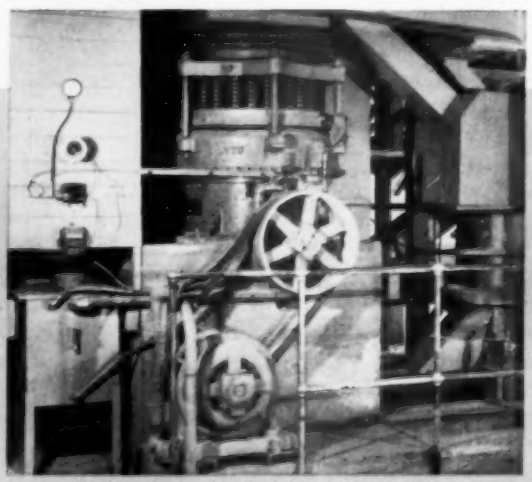
Fitzgerald Bros. Construction Co., Troy, N. Y., like their 48-S and two 36-FC Gyraspheres.

in New England and New York

HARD ROCK QUARRIES...

TELSMITH Gyraspheres

Here—where rock is as hard as it comes—the Telsmith Gyrasphere has proved itself. With highest capacity, low power needs, lowest upkeep—to give more and better aggregate *at lowest cost per ton* at a greater profit. Four sizes: 24", 36", 48" and new 66" . . . for coarse or fine crushing. Get Bulletin 274.



Y-20 1059

Cortland Stone Co., Peekskill, N. Y., find their 24-S Gyrasphere very efficient.

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WASHINGTON LETTER

by EDGAR POE

Misdeeds Probe is Under way

A team of 10 investigators under the jurisdiction of Chairman John A. Blatnik, Democrat of Minnesota, and the House Public Works Subcommittee, is gathering substantial information on alleged irregularities involving the great road construction program in this country. It will be another several months before the full spotlight will be turned on a series of alleged misdeeds of fraud and mismanagement in construction across the country.

Private engineers testified before the Blatnik Committee of $524,000 of over-payments in connection with the construction of a 13-mile interstate link in Oklahoma. As a result of information already turned up, Federal Highway Administrator Bertram D. Tallamy has called on all state highway departments to aid in all-out assistance and cooperation of inspection of the road-building activities.

Representative Blatnik said that the incidents of reported misdeeds turned up thus far represents only a small fraction of one percent of the huge expenditures. Meantime, it becomes more and more apparent that the highly publicized Interstate Highway System, originally scheduled for completion in 1972, is going to be extended beyond that date, unless additional revenues are found as the cost of the highways continues to go up.

Congress is hesitant about increasing gasoline and other user costs, fearful that it would put the brakes on automotive and truck use.

New device Evaluates Clay soils

An engineering short cut to evaluating potentially dangerous conditions existing in some clay soils has been developed by the Federal Housing Administration. The short cut is a simple field device for testing the behavior of soils involving residential foundations, driveways, utility installations, etc. Although many at FHA always refer to the new device as the "Black Box," it has been formally designated as the FHA Soil PVC Meter TS 5:6.

The PVC (potential volume change) refers to the maximum possible volume change that the soil could undergo when subjected to changing moisture conditions due to swelling or shrinkage. For example, some soils, dry at the start, swell if wetted; while other soils, wet at the start, shrink if dried. In the early stages of the project, detailed laboratory tests with the new device were undertaken on clay soils from widely separated areas and representing varied behavior patterns.

There are two unusually attractive features about the PVC Meter TS 5:6. Namely, the PVC tests can be completed in 2 hr. or less and, secondly, even though an individual is unfamiliar with or inexperienced in soil engineering and classification, he can quickly determine the degree of volume change in the soil sample.

Compulsory Union dues To continue

Use of compulsory union dues for political purposes by unions will continue to be legal for another year at least. The Supreme Court of the United States will hear additional arguments on the controversy in the autumn after the tribunal reconvenes in October. This means that a decision probably will not be forthcoming until late this year at the earliest.

The case grew out of a section of the Railway Labor Act which sanctions union shops in the industry. Six employes of the Southern Railway complained that a part of the union dues they are compelled to pay under a closed-shop contract are used to support candidates and political doctrines which they oppose.

The Georgia Supreme Court upheld the workers, nullified the contract, and held that section of the National Railway Labor Act unconstitutional. The highest court in Georgia declared:

"One who is compelled to contribute the fruits of his labor to support or promote political or economic programs or support candidates for public office is just as much deprived of his freedom of speech as if he were compelled to give his vocal support to doctrine he opposes."

The Supreme Court of the United States held arguments on this case earlier in the year, but is scheduled to hear additional arguments when the tribunal reconvenes.

Cement, asphalt Research urged By Highway Board

The Highway Research Board has come up with a series of recommended research projects involving various paving materials. Titles of some of these proposed projects are: Creep and drying shrinkage in concrete as related to prestressed concrete design; investigation of prestressed concrete pavements; investigation of the mechanism of "fatigue" in concrete; method for predicting creep in structural concrete from short time tests; suggested experimental portland cement concrete pavements; justification, or warrant, for lighting installations on freeways; asphalt durability in relation to water, air and weather erosion; research and development of nonshrinking and of expansive cements to minimize shrinkage of portland cement concrete pavements.

Under the heading of research problems in soils, geology and foundations, the Highway Research Board's committees recommended several research projects. These included a proposed study of materials like corrugated metal, concrete, clay, asbestos cement, etc., as sub-surface drainage installations in arriving at adequate, economical designs.

The Research Board said that although progress has been made, present knowledge concerning the drainability of soils used in engineering structures is not well established. Therefore, it is proposed to conduct studies seeking to establish the response to various soils, soil aggregates, subbases and bases to properly construct subsurface drains.

In another recommendation under the title of thickness design procedure for pavements with soil-cement base courses, the Board said a nationally accepted procedure for the structural thickness design of pavements with soil-cement bases for different wheel loads, traffic volumes and subgrade and climatic conditions does not exist. It is proposed to use currently used design procedures for possible application to designs involving soil-cement to determine if some locally used procedure may be suitable for national application.

Pollution Problems

Congress seems likely to deal more and more with air pollution. Senator Kuchel, an advocate of larger federal appropriations for air pollution problems, rose on the Senate floor. The California Republican declared that air pollution is not a temporary problem, but one which is almost certain to require continuing attention in the interest of public health, safety and comfort.

With smog a health hazard to many of his constituents, the westerner is pushing the point. He advocates giving federal agencies and officials with broad authority to assemble and use all resources of the government in comprehensive studies, investigation, and experimentation to devise means for not only curbing, but eventually eliminating polluted air from American cities.

Emergency Powers Extension

The President's emergency powers to set up priorities for defense contracts, to allocate materials and to make loans for defense plants and materials have been extended two years. The emergency law, enacted first in 1950 at the beginning of the Korean war, will be in effect until June 30, 1962. The law, known as the Defense Production Act, also authorizes the President to order businessmen to cooperate voluntarily in meeting defense needs without any anti-trust violations.

Business Expected to Increase

A new boomlet toward the end of the year may be shaping up, government economists say. At the same time, the economists point out that the nation's economy is quietly going through an economic adjustment. Meantime, some of the industries feeling the pinch of the readjustment include steel, operating at about 50 percent of capacity and facing a 20 percent profit reduction; automobiles, where sales are good but inventories are at record high levels; housing, which is picking up, but substantially below last year, and several defense industries.

Sometime in the autumn there should be a spurt in defense spending, interest rates should edge downward and consumer sales should rise, Washington economists assert.

Transport Department Advocated

A new government department to take over the administrative functions of various agencies and branches now engaged in transportation activities is proposed by Senator Clifford Case, Republican of New Jersey. The proposed department, headed by a cabinet-level secretary, would take over the Federal Aviation Agency, Maritime Administration, Maritime Board, Bureau of Public Roads and some functions of the Army Corps of Engineers and the nonregulatory duties of the Interstate Commerce Commission. The Senator maintains that his proposal would lead to a "coherent and modern system out of the present unstable and uneconomic jungle of diverse and unrelated transportation systems."

WHERE DO YOU STAND ON COMPUTER CONTROL— LEADING OR LAGGING?

Far-sighted leaders in industry are realizing the benefits made possible by applying computer control systems to their processes.

Working with these leaders, General Electric has already pioneered the application of twenty on-line GE-312 computer systems now being implemented in these basic areas —STEEL, ELECTRIC UTILITIES, CHEMICAL, CEMENT, and PRODUCTION CONTROL for various manufacturing applications.

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Add to this versatile equipment the computer systems engineering ability demonstrated by General Electric in implementing these twenty GE-312 system applications.

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LABOR RELATIONS

A ROUNDUP OF ACTUAL DAY-TO-DAY IN-PLANT PROBLEMS AND HOW THEY WERE HANDLED BY MANAGEMENT MEN

How would you decide?

If an employer violates the union contract, do employes have a right to go out on strike?

What Happened: A lot of tension was in the air between management and the employes. Both sides got into a hassle over tools. It seems that some of the employes were required to buy their own tools, while other workers were supplied with company tools.

One day the company changed its policy regarding the provision of tools, and many workers took this to be a breach of the union agreement. At 6 o'clock that evening, the second shift walked out on strike. They returned to work the next day. The company picked out the alleged leaders of the walkout and fired 10 of them.

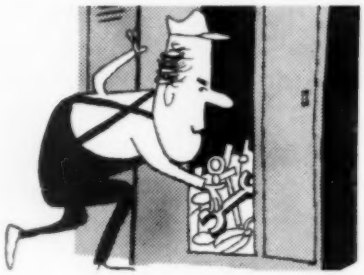
At arbitration the company claimed its right to discharge on the grounds that there was a "no strike" clause and the workers were obligated to obey it.

The union's position was that the men were goaded into the action by the company's own violation of the agreement.

Was the union:
Right? ☐ **Wrong?** ☐

What Arbitrator Bothwell ruled: "The union states that the walkout was the result of a situation which was largely created by the action of the company. Even though action by management may have contributed to the walkout, this does not constitute a defense since the grievance machinery was not used. Even if the company should violate the contract, this is not a proper defense since the grievance procedure exists for this very purpose."

Can an employe be fired for keeping company tools in his locker?



What Happened: When a lot of tools began to disappear the company decided to do something about it. A diligent search of the plant premises was started. In the course of this investigation, employe lockers were opened.

In one of the lockers, a real cache was discovered—a bundle of maintenance tools. When he was confronted with this find, the employe claimed that he had no intention of stealing any of these tools. He put them in his locker so he could use them when needed. He charged that the company was lax in control of tools. They would be lying around and when he had to use them, some were often missing. So he put them into his locker. None of the tools could be used personally for they were all specially designed. Also, the worker said, management had no rules prohibiting employes from putting company tools in the lockers.

He was fired, and the case went to arbitration.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Teple ruled: "There is no doubt about the right of management to discipline employes for proper cause. This is obviously necessary to the efficient conduct of company operations. There is no doubt that theft of company property is one of the most serious infractions committed by an employe. No rule prohibiting the unauthorized taking of company property is normally necessary. An employer has a right to expect basic honesty in his employes.

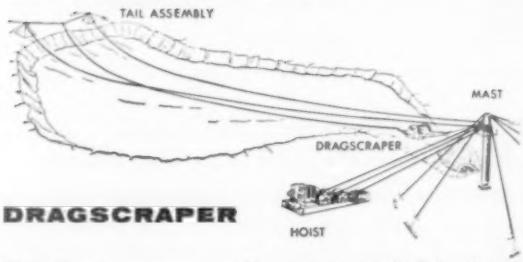
"At the same time, arbitrators normally will not sustain disciplinary action based upon alleged theft unless the company is able to prove the charge beyond a reasonable doubt. In this case, however, there remains the admitted fact that the grievant deliberately removed these maintenance tools from the places where they were in use and placed them in his locker with full knowledge that he was not authorized to do so. Some of these tools were not only valuable, but were frequently needed by other company employes in connection with maintenance work.

"Whether or not the grievant intended to steal this property, it is clear that he effectively removed it from the area where it might have been used when needed. There is not one word of testimony that the grievant notified his foreman or anyone else that he had these tools in his locker and that they would be available whenever needed. To thus hoard company equipment, of considerable value, needed by other employes, must have had the same practical effect, so far as the company was concerned, as a theft. The grievance is therefore denied. The company was justified in discharging this employe." **END**

Cut Materials Handling Costs in Half . . . Dig *and Haul* with a Sauerman Machine

Operating costs as low as 6¢ per ton are reported by Sauerman DragScraper and Slackline Cableway owners. This cost includes labor, power and maintenance when digging free-caving material on average haul distances.

When you use a Sauerman DragScraper or Slackline Cableway, one machine does *both* digging and hauling from deposit to plant. No double handling is required. You cut labor and equipment costs in half—or even more—because a single Sauerman Machine, controlled by one man, replaces the multiple equipment needed for other methods.

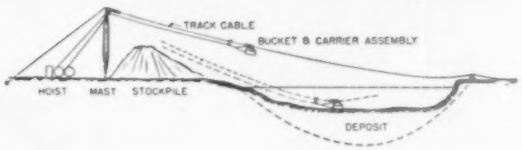


DRAGSCRAPER

DragScrapers are usually recommended for bank or pit deposits. They dig from hillsides or underwater as easily as on level ground and can haul directly to hopper or field conveyor. The Sauerman DragScraper hoist is designed for continuous duty and many years of service. The operator's control station may be remotely located for maximum visibility of deposit and plant.

DragScrapers are built in sizes from 1/3 to 15 yds. to satisfy practically all tonnage requirements.

SLACKLINE CABLEWAY



When deep digging is required or anticipated in the future, a Sauerman Slackline is usually best for the job. This powerful excavator can dig 100 ft. below water, lift its load and deliver the material to a stockpile on a 1000-ft. span.

The Slackliner Bucket inhauls at high speed and dumps automatically. Dumping point is determined by a stop button on the track cable. Gravity returns the bucket to the digging point, completing the fast operating cycle.

The use of a stockpile permits a single 2-yd. Slackline Cableway to handle the material requirements of a 200-tph. plant. Slacklines are built in sizes up to 3½ cu. yds.

★

Find out how you can save with a Sauerman Machine. Write or call, giving tonnage requirements and a description of your deposit. Sauerman engineers will supply their recommendations on the most economical machine for you.

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FALK Steelflex SPACER COUPLINGS
save time and money in industrial operations

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Cut disconnect-reconnect time by as much as 50%

The FALK Spacer Coupling is specially designed for quick installation or removal *without disturbing the driving or driven unit.* This feature can save you up to 50% in disconnect-reconnect time when critical equipment—a process pump, for example—needs repair or replacement.

Here's another saving: with the FALK Spacer Coupling, you can quickly realign shafts *without the usual loss of operating temperature!*

And still another: you can remove or reinstall the FALK Spacer as a unit *without draining the lubricant.*

Because of its exclusive grid-groove Steelflex design, the FALK Spacer can accommodate residual misalignment—parallel, angular, or (most important) *both.* Also, it provides torsional resiliency that cushions shock and vibration. Thus it saves wear-and-tear on your connected equipment.

To prove these claims and enjoy these savings, install a FALK Spacer on one application—and see for yourself. Consult your FALK Representative or Authorized Distributor.

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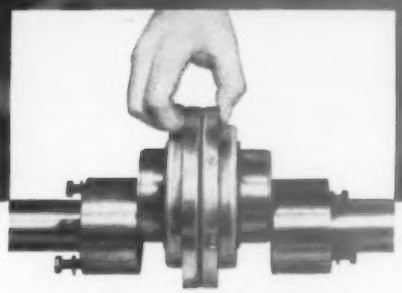
MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS
Representatives and Distributors in many principal cities.

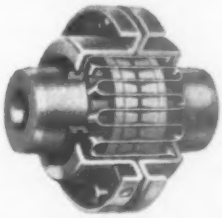


EASY AND QUICK TO INSTALL, DISCONNECT OR RECONNECT

First, mount shaft hubs to allow proper distance between hubs; then, align driving and driven units.

Second, compress Spacer to fit space between hubs and tighten cap screws to pull spacer hubs into the registered fit.

To disconnect, reverse the second step. No draining of lubricant necessary.



The heart of the FALK Spacer ...the basic Type F Steelflex
Write for Service Manual 4838

FALK
...a good name in industry

PEOPLE IN THE NEWS

J. R. Kringel

J. A. Dooley

H. J. Schwellenbach

New York Trap Rock promotes three officials

JOHN R. KRINGEL has been promoted from vice president of production to executive vice president of New York Trap Rock Corp., West Nyack, N. Y. Joseph A. Dooley, formerly sales manager, has been named vice president of sales, and Henry J. Schwellenbach, production manager, has been appointed vice president of production.

Mr. Kringel, a native of Denver, Colo., joined the company in 1934 as superintendent of the Haverstraw quarry. The following year he was named assistant to the vice president of production, became assistant vice president in 1956 and vice president of production in 1958.

Mr. Dooley was appointed sales manager in 1956 after serving as assistant sales manager for three years. Born in Brooklyn, he attended the University of Dayton where he studied business administration.

Mr. Schwellenbach, a native of the Upper Peninsula of Michigan, was graduated with a BS degree from Michigan College of Mining and Technology. He joined New York Trap Rock in 1955.

Walker and Bloem receive Sanford E. Thompson Award

STANTON WALKER and Delmar L. Bloem, director of engineering and associate director of engineering, respectively, of the National Sand & Gravel Association and the National Ready Mixed Concrete Association, received the Sanford E. Thompson Award at the recent meeting of the American Society for Testing Materials, for their paper on "Variations in Portland Cement."

Mr. Walker is a native of Indiana and a graduate of the University of Illinois from which he received his BS degree. In 1917 he joined the Portland Cement Association as a research engineer in the structural materials research laboratories. Since 1926 he has been director of engineering of the National Sand & Gravel Association, and since 1930 director of engineering of the National Ready Mixed Concrete Association. He is also director of the Joint Research Foundation of NSGA and NRMCA at the University of Maryland.

Mr. Walker has been a member of ASTM since 1920 and has served actively on Committees C-7 on Lime, C-9 on Concrete and Concrete Aggregates, C-1 on Cement, C-12 on Mortars for Unit Masonry and D-4 on Road and Paving Materials. From 1940 to 1942, he served as a member of the executive committee of ASTM and as a director from 1951 to 1954.

In addition to his activities in ASTM, Mr. Walker is past president and honorary member of the American Concrete Institute, past chairman and member of the executive committee of the Highway Research Board and member of AIME. He is the recipient of the Roy W. Crum Award of the Highway Research Board, the ASTM Award of Merit and the Frank E. Richart Award and is author of numerous papers dealing with research in concrete and mineral aggregates.

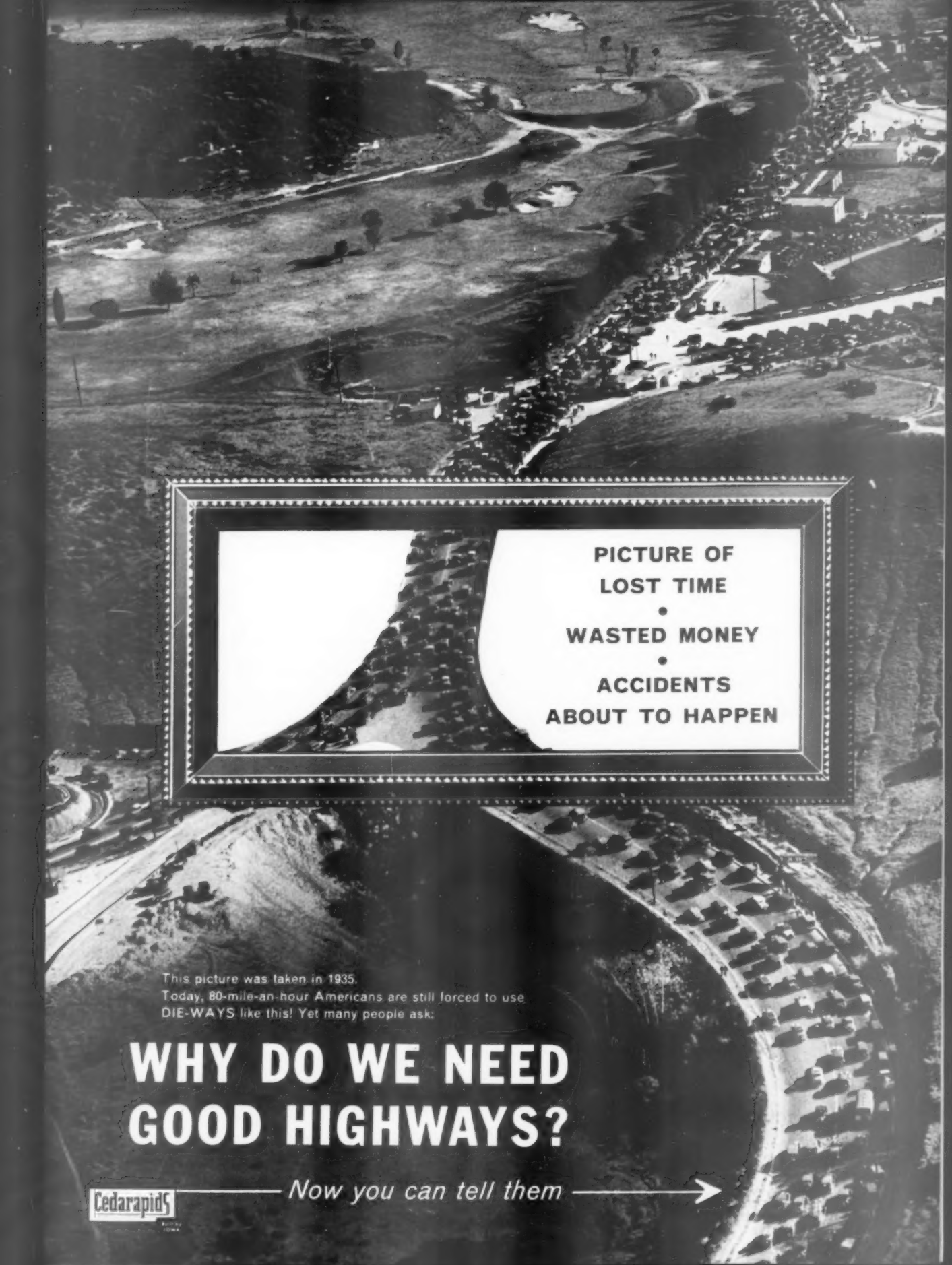
Mr. Bloem, a native of South Dakota, received his BS degree in civil engineering from Iowa State College. He joined the NSGA and NRMCA staff in 1945 and was appointed assistant director of engineering in 1949 and associate director of engineering in 1954, at which time he became a member of ASTM. He has served on Committees C-9 on Concrete and Concrete Aggregates, D-4 on Road and Paving Materials, C-12 on Mortars for Unit Masonry Materials and C-11 on Gypsum. He is a member of the American Concrete Institute and the Highway Research Board.

John Curtin resigns as Warner chairman-president

JOHN CURTIN, JR., has resigned as president and chairman of the board of Warner Co., Philadelphia, Pa., after 30 years of service. Robert C. Collins, vice president of sales, was elected acting president, and Reed C. Bye, a director, was named chairman of the board.

Mr. Curtin joined Warner Co. in 1930 as a salesman and became assistant to the general sales manager of the lime division in 1938. He was named general manager of the western lime operations in 1943 and a year later was elected a vice president and a member of the board. In 1947, he became executive vice president and the following year was named president. He has been chairman of the board since 1957.

(Continued on page 37)



This picture was taken in 1935.
Today, 80-mile-an-hour Americans are still forced to use DIE-WAYS like this! Yet many people ask:

WHY DO WE NEED GOOD HIGHWAYS?

Now you can tell them →

Cedarapids

43 REASONS WHY AMERICA NEEDS BETTER HIGHWAYS NOW!

Strangulation of our national economy by a gigantic nationwide traffic jam, and the crippling of our defense effort through failure to keep the Federal Highway Program going, would be more costly than any of us can afford.

But most American citizens *don't know why* we need good roads. They are apathetic. Because they do not understand, there is little public support for a well-planned, nationwide system of interstate, state and rural roads.

It is up to us to give the public the facts . . . show our friends, neighbors, and associates the benefits the Highway Program will bring to each individual . . . how it affects his pocketbook, even his life. Only when every citizen knows the facts can public opinion influence *intelligently* the men who make the laws to keep the Highway Program rolling.

Here are 43 of the hundreds of reasons why we must have better highways now. Add your own reasons and use them all to help obtain the enthusiastic local support we need.

GOOD ROADS SAVE MONEY

1. Total annual avoidable waste over *all* roads in the U.S. amounts to $3 billion. Interstate Highways would save $550,000,000 in gas consumption, brake and tire wear, vehicle operation—save $725,000,000 now wasted on traffic accidents —save $825,000,000 in time lost by commercial vehicles.

2. Modern Interstate Highway engineering eliminates steep grades, sharp curves, intersections at grade, stop and go driving. Good highways can bring about annual savings of $750,000,000 in direct operating costs of trucks and buses.

3. Payments of insurance covering property damage and personal injuries resulting from highway accidents equal 12½¢ per gallon of gas consumed, That equals $116 for every motor vehicle registered.

4. It costs less right now to build a typical mile of Federal Aid Highway than it did during the first three months that the 1956 Highway Act was in effect.

GOOD ROADS SAVE LIVES

5. In 1920, the traffic death rate per 100 million miles was 28.2. In 1940, the death rate was 11.4. Then we started building better, safer roads. Bertram D. Tallamy, federal highway administrator, predicts that the death rate will decline from the 5.6 per 100 million miles in 1958 to 5.0 in 1970 and to 4.4 in 1975.

6. The controlled access highway is at least 2½ times safer than the ordinary highway. On Virginia's Shirley Highway, with controlled access, the fatality rate is 0.8 deaths per 100 million miles. On the parallel U.S. 1, with no control of access, the death rate is 10.6.

7. Traffic accidents today are killing 38,000 people annually. Experts estimate that highways *engineered for safety* would save 4000 lives per year. By 1970, continued use of The Interstate System could save 37,800 people.

8. If traffic volume increases by 50% in the next ten years, there will be 55,000 fatalities a year—unless safer roads cut the rate.

9. In Chicago, the chance of having an auto accident on congested streets is 30 to 50 times greater than on the new Congress Street Expressway.

10. In 1959, accidents cost $4.3 billion. Modern highways *can* eliminate a very large part of the monetary waste of accidents.

GOOD ROADS FOSTER ECONOMIC GROWTH

11. Modern highways are a sound, durable investment in the growth of the Nation.

12. The dollar value of goods and services for a specific period is called the Gross National Product. $1 billion of highway construction contributes to the Gross National Product as follows: Steel, 510,000 tons; bituminous materials, 995,000 tons; cement 16,000,000 barrels; explosives, 18,345,000 lbs.; aggregates, 76,415,000 tons; petroleum products, 122,794,000 gallons; construction equipment, 34,584 pieces; trucks and cars, 22,500 pieces. These are based on each $1 billion in excess of an annual rate of $5.8 billion of construction.

13. The New York Thru-Way is officially credited with stimulating 650 million dollars worth of industrial, commercial and residential development, including $50 million around Tarrytown alone.

14. With the New Jersey Garden

State Parkway, the gain in taxables and retail business in the counties it serves is *twice* that of New Jersey's remaining 11 counties.

15. On Route 128 near Boston, some 227 companies have built 17 industrial parks and 175 million dollars worth of buildings to house upwards of 28,000 people—workers with good wages to spend.

GOOD ROADS ARE ESSENTIAL FOR NATIONAL DEFENSE

16. In case of war, *all* sections of the country must be swiftly available for the defense effort.

17. Highways are relatively invulnerable to atomic attack. It would take 20,000 Hiroshima-type bombs to destroy the 40,000 miles of the projected Insterstate System.

18. We need good highways to evacuate people from our cities; bring in food; bring in medical supplies and help; move large volumes of military vehicles and weapons.

19. Highways are extensions of production lines; defense production depends on them. During World War II, 8 out of every 10 parts needed to make a tank in Cleveland came by truck from 23 states. 75% of the workers in 749 defense plants drove to work in their automobiles. 60% of all out-bound tonnages from defense plants was road-borne.

20. A network of good highways will assure nation-wide mobility for all our defense resources.

GOOD ROADS BENEFIT LABOR

21. The American working man drives his own car to his job. He can offer his services throughout a greater area; he has a greater diversification of jobs to choose from.

22. With good highways, the laboring man can think in terms of minutes rather than miles of driving to and from his job.

GOOD ROADS BENEFIT FARMERS

23. American farmers operate over 6,406,000 motor vehicles (including 3 million trucks). 89% of all farm products now reach their markets by highways.

24. Better rural roads bring markets and sources of farm supplies closer together, make schools more accessible to farm homes, make medical services readily accessible.

GOOD ROADS INCREASE BUSINESS

25. One out of every six businesses (mostly small, independent firms) serve the Transportation Industry. Good roads are a shot in the arm to the small businessman.

26. Of the people who do the buying, 60% own automobiles. American consumers spend $38 billion per year to own and operate their cars, helping to support garages, service stations, manufacturers of automotive parts and accessories, etc.

27. 60% of American buyers purchase goods that are transported via highways, streets and alleys. Fast deliveries increase business.

28. 70 million Americans take vacations by car each year (over 75% of tourist travel is by car), averaging 1013 miles per round trip. Many others travel by bus. Altogether they spend $9.2 billion on vacations. This is big business for motels, resorts, restaurants, and souvenir shops, to name a few!

29. The annual bill for recreation travel is $14 billion. 22% of this is automobile expense. Big business for the automotive industry!

GOOD ROADS FURTHER FULL EMPLOYMENT

30. One out of every seven American jobs is in the field of Highway Transportation.

31. Truckers provide over 5,750,000 jobs. Highway Transportation Industries provide 9.7 million jobs. Employed is a labor force equal to the population of all New England states, Arizona, Colorado, Idaho, Montana, New Mexico, Wyoming.

32. Each $1 billion spent on highway construction equals 102 million man-hours of employment on the site of construction and 126 million man-hours off the site—a total of 228 million man-hours of labor.

33. In 1958, an extra $400 million in highway contracts, let as an anti-recession measure, provided 137 million man-hours of employment and broke the back of the recession.

GOOD ROADS BENEFIT ALL INDUSTRY

34. For the Trucking and Motor Carrier Industry alone, Interstate type highways provide these advantages: —Reduction in number of power units required; use of lighter tractors; increased tire life; reduction in fuel and maintenance costs; reduction of accidents and insurance premiums; year-'round maintenance of on-time schedules for livestock and perishable goods.

35. The Private Consulting Engineer profession carries 40% of the engineering load of the new Interstate System.

36. Utilities are free from the burden of acquiring easements of private land because so many consumers are located on good highways. In Oregon, a utility study shows savings of about $100 a mile on 3212 miles of public right-of-way, mostly passed on to consumers.

37. Practically every industry is stimulated by increasing motor vehicle registrations. In 1959, registrations totaled 70,416,000 (3.1% more than in 1958). *In 1971*, it is estimated that 101,200,000 motor vehicles will travel over a trillion miles annually (20.7% on the Interstate System). *In 1976*—114 million motor vehicles will travel 1.2 trillion miles a year.

38. By 1976, 230 million people will need industrial goods and services fostered by increased travel on highways, rural roads and city streets.

GOOD ROADS BENEFIT EVERY CITIZEN

39. 8 million children ride buses to school every day of the school year. They need *safe* all-weather roads.

40. Movement of goods and people is faster on modern highways.

41. Time saved means lower transportation costs and lower prices for truck-borne merchandise.

42. Annoying, dangerous traffic congestion is reduced.

43. Modern highways, engineered to last by the application of results of the AASHO test road research at Ottawa, are the cheapest investment a private citizen can make to insure his life, his security, his country's growth, and his children's future.

Cedarapids Built by IOWA

There is *one* big reason why YOU should get behind this program for enlightening the public on the benefits of a continuing Federal Highway Program. Highway construction is vital to your way of life and the growth of your community. Here you have the ammunition to inform and mold public opinion into supporting, and demanding, vital highway legislation. *Use it!*

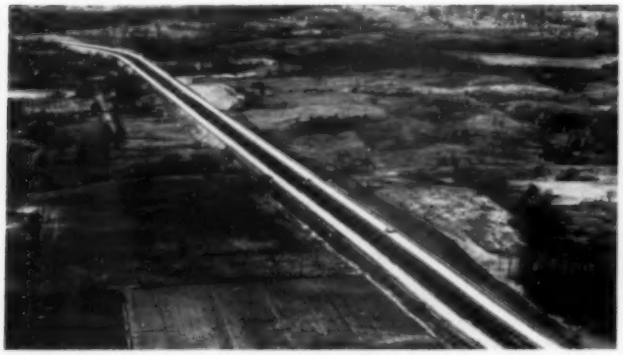
BUILD BETTER HIGHWAYS NOW! *Save Lives—Save Time—Save Money*

Sponsored as a public service by **IOWA MANUFACTURING COMPANY** *Cedar Rapids, Iowa, U.S.A.*

A GLIMPSE OF THE FUTURE
demanded by Mr. and Mrs. America

Through-city expressways provide fast transport of goods and services; save time, money and lives of city workers; foster economic growth.

Well-planned interchanges like this relieve traffic congestion to assure safe, easy access to transcontinental highways from urban areas, speeding produce from factory to consumer.



Straight, safe, controlled access Interstate Routes should cover the Nation for greater mobility in Peace or War. Goods and people, weapons and troops must move swiftly to every section of the country to strengthen our economy and defense efforts.

America today is a nation on wheels. Broad, safe highways open new recreational areas and expand tourist trade. Good, all-weather roads across mountainous terrain speed transcontinental commercial travel.

Cedarapids
Built by IOWA

BETTER ROADS MEAN BETTER LIVING

INS 18

Sponsored as a public service by YOUR CEDARAPIDS DEALER
in cooperation with Iowa Manufacturing Company, Cedar Rapids, Iowa

PRINTED IN U.S.A.

(Continued from page 32)

A. Allan Bates of PCA becomes ASTM president

DR. A. ALLAN BATES, vice president for research and development, Portland Cement Association, Chicago, Ill., was recently elected president of the American Society for Testing Materials to serve for a one-year term.

A native of Elyria, Ohio, Dr. Bates was graduated from Ohio Wesleyan University with an AB degree. He received a BS degree in metallurgical engineering and an MS degree in engineering from Case Institute of Technology. He also received the degree of Doctor of Science from the University of Nancy, France. Stevens Institute of Technology awarded him the honorary degree of Doctor of Engineering and Rose Polytechnic Institute, the honorary degree of Doctor of Science.

Dr. Bates has been a member of ASTM since 1946 and of the ASTM board of directors since 1955. He has been active in ASTM work for many years as representative of PCA on Committee C-1 on Cement and Committee C-9 on Concrete. He is a member of the executive committee of the Building Research Advisory Board of the National Academy of Sciences. He is also a member of AIME and the American Concrete Institute, of which he is serving as director.

W. S. Weaver has 80th birthday

W. S. WEAVER of Temple City, Calif., who will be remembered by oldtimers in the cement, lime and gypsum industries, recently celebrated his 80th birthday. Many years ago Mr. Weaver was western manager for Fuller Co. and later for the Bates Valve Bag Co. (now St. Regis Bag Co.). During the 20's and 30's he was known to about every cement executive in the United States. He was a pattern maker with Fuller Co. when a very young man and came up through the ranks.

Milne elected to head Kentucky Stone Association

W. D. MILNE, president, Kentucky Stone Co., Louisville, Ky., has been elected president of the Kentucky Crushed Stone Association. W. O. Snyder is executive secretary of the Association.

(Continued on page 40)

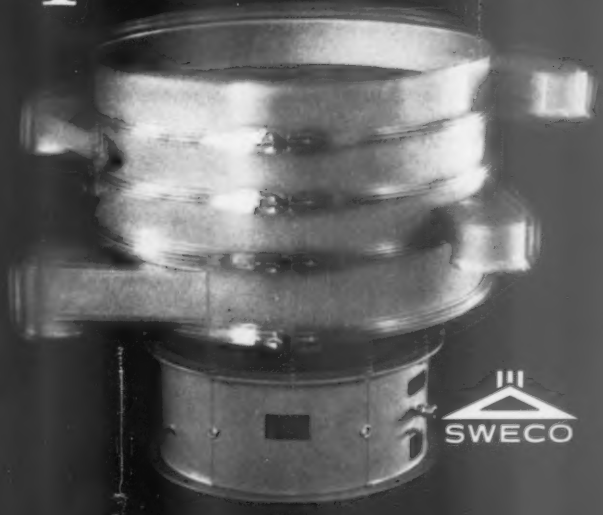
screens

GREATEST CAPACITY, per-square-foot of screen cloth area • EFFICIENT FOR ALL MATERIALS, wet or dry, fine or coarse, hot or cold • EASY TO INSTALL, light-weight, no transmitted vibration • ECONOMICAL OPERATION, low maintenance • FLEXIBLE, 18", 30" & 48" dia. units, single or multiple separations • CLEAN SEPARATION, ACCURATE SIZING, in range from coarse to 325-mesh • LONG SCREEN CLOTH LIFE, less blinding • SELF-CONTAINED, ready to operate.

rock

SWECO Vibro-Energy Separators do many vital jobs for the rock products industry, faster and better. For example: Sizing special-purpose fine sands and silicates. Sizing coarse, medium and fine abrasives. Screening oversizes from milled cement. Sizing fine crushed limestone. Sizing fine crushed lump lime. Scalping hydrated lime. Separating oversize milled stones from water, and other applications.

products



For technical data or free screening demonstration in *your* plant, with *your* materials, write: Dept. 9-14

SOUTHWESTERN ENGINEERING COMPANY

4800 Santa Fe Avenue, Los Angeles 58

Engineers • Constructors • Manufacturers

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Enter 1291 on Reader Card

966 TRAXCAVATOR—2¾ CU. YD. STANDARD BUCKET • 140 HP Cat D333 Diesel Engine, turbocharged to give extra efficiency and quick response for machine drive and bucket hydraulics. • 57" reach at 7' dumping height . . . maximum lift—12' 10". • LIVE ACTION hydraulics for tough excavation, fast lift and dump. • DUAL-RATIO steering for work and highway travel. Operator shifts lever on steering column to select work or travel ratio. For work cycles and quick turns, one-half twirl of steering wheel puts Traxcavator in maximum turn. For travel ratio, 2 twists of wheel are required for sharpest turn. • DIRECT ELECTRIC STARTING standard. Gasoline starting engine optional.

CATERPILLAR ADDS 2¾ yd. and 1¼ yd. MACHINES

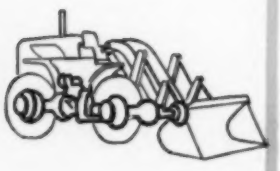
THE 966 and 922

Cat's first wheel loader, the 2 yd. 944, introduced this spring, has already gained an acceptance unmatched in machinery history. Now there's a full line and one for your job: the 966, 2¾ yd., 140 HP, for high production jobs where you measure time in tons of material loaded; the new 922, an 80 HP, 1¼ yd. Traxcavator with all the safety and fast operating features of the two bigger machines. The 922 can give you speed, versatility and production to handle all those jump-and-run jobs.

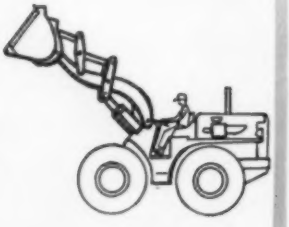
Have you seen a 944 working in your area? Have you asked the owner about its dependability and favorite features? He's probably got some mighty impressive answers. And frankly it's understandable why these Traxcavators have made a name for themselves so quickly. There is a *7-year* history of thorough testing and development behind these *new* machines. They come from the manufacturer with 23 years' loader experience and 20 years of wheel tractor know-how.

Look at the features that are on all 3 loaders: clean, open cockpit, easy to get into; bucket arms up front away from the operator; well-balanced design; long dumping reach (nearly 5' on the 966), soaring lifts to get over truck sides

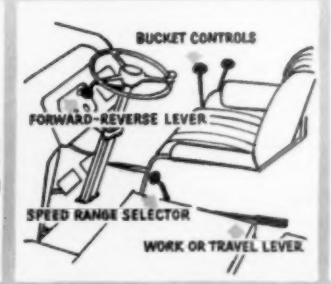
Both the 966 and the 922 have all the features proved in the field by the popular 944 Traxcavator



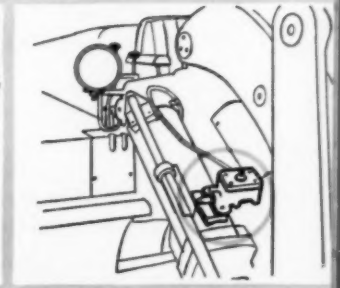
POWER SHIFT TRANSMISSION with torque converter gives smooth, instant shifting for 1st-2nd speeds—forward and reverse. In travel range, the machine is in 2-wheel drive for high-speed roading. A shift to work range automatically puts power to all 4 wheels for full traction.



OPERATOR SAFETY Lift arms and cylinders are all forward of the cockpit . . . giving complete freedom of movement. Visibility is excellent at all times. It's easy and safe to get into a Traxcavator from either side . . . up 3 wide steps . . . no ladders to climb. Tires are covered by fenders.



OPERATOR CONVENIENCE Bucket controls are on the right side, leaving the left hand free for machine operation. The forward-reverse lever is mounted on the steering column for finger-tip shifting without decelerating, steering is power boosted with dual-ratio on the 966.



AUTOMATIC BUCKET KICK-OUT DEVICE allows faster cycles. After loading bucket, pull lift lever to up position. Bucket goes up to dumping height and control kicks into hold position automatically. While lowering bucket after dumping, set tilt lever, and bucket is positioned for digging.

922 TRAXCAVATOR—1¼ CU. YD. STANDARD BUCKET • 80 HP. Your choice of compact 4-cylinder Caterpillar turbocharged Diesel Engine (uses low-cost furnace oil without fouling) or 6-cylinder gas engine with large cubic inch displacement for long life and sustained power. Use the type of engine that matches your other equipment. With either engine you have one source of warranty responsibility . . . one source of parts and service . . . your reliable Caterpillar Dealer. • Long 40¼" reach at 7' dumping height . . . maximum lift of 11' 2". • For top production in its class, the new 922 Traxcavator has all the safe, fast operating features of the bigger machines.

TO ITS WHEEL LOADER LINE...

TRAXCAVATORS

and railroad cars; automatic bucket controls to speed cycles; dependable Cat Diesel power with optional gasoline engines on two smaller models; Cat power shift transmission to change speed and direction with a finger touch, without decelerating; and service features like the dry-type air cleaner and unitized construction.

There's one man in your area with all the facts — your Caterpillar Dealer. Get in touch with him now. Ask for a demonstration — once you watch one of these machines you'll want it!

Caterpillar Tractor Co., General Offices, Peoria, Ill., U. S. A.

CATERPILLAR

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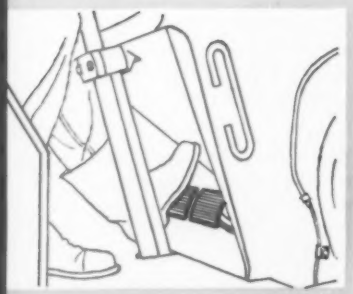
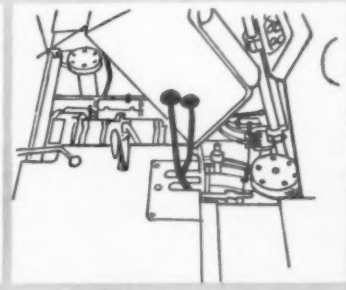
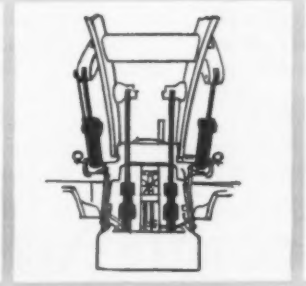
TRAXCAVATORS ARE MAKING OTHER LOADERS OBSOLETE



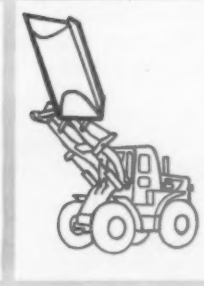
DUAL BRAKES The left brake pedal neutralizes the transmission as it stops the machine. This transfers extra power to the bucket . . . assuring full loads even in tough material. The right brake pedal stops the machine with the transmission engaged . . . giving full control for roading downhill.



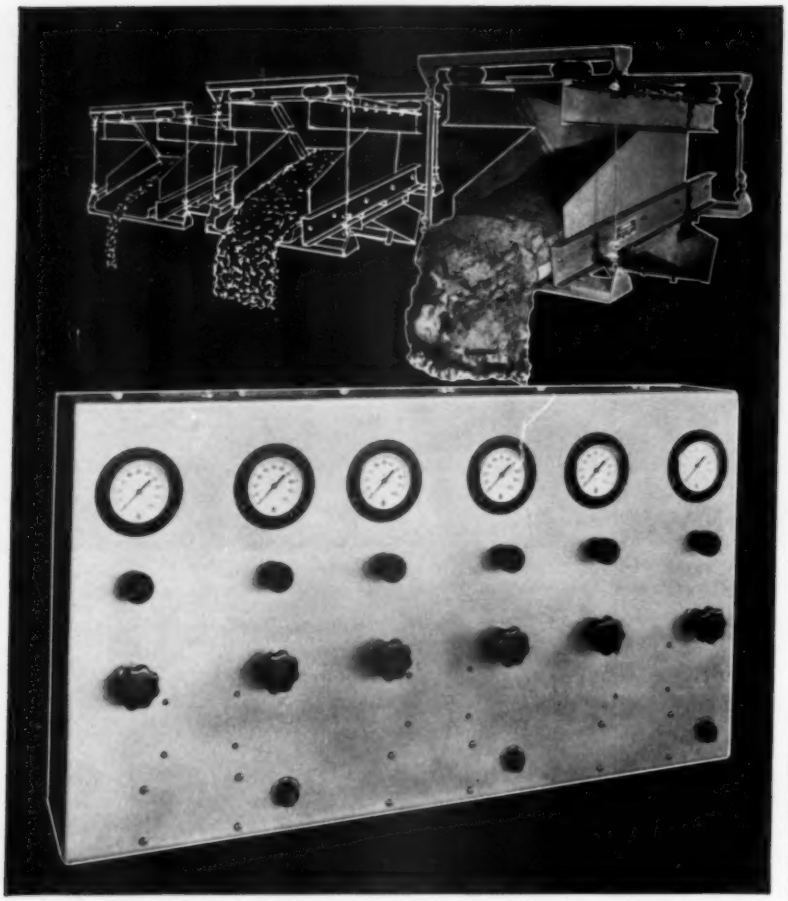
EASY SERVICE ACCESS The seat tips forward for quick access to transmission oil filter and control linkage adjustments. Unit construction allows independent removal of engine, transmission, other major components. The dry-type air cleaner can be serviced in about 5 minutes.



LIVE-ACTION HYDRAULIC SYSTEM Plenty of power from the engine is always available to the husky vane-type pump that supplies the pressure and volume for fast bucket action. Control valves are enclosed in the steel reservoir for complete protection. System is full-flow filtered.



AVAILABLE WITH A COMPLETE LINE OF ATTACHMENTS, including special buckets for light or heavy materials, lift forks for lumber and palletized materials, and the exclusive side dump bucket. A fiber-glass cab is also available.



From a TORRENT to a DRIBBLE... AMPLITROL means precise control

With Carrier Amplitrol Feeders you can control discharge rates from ANY distance. Carrier Feeders give you precise manual OR automatic control in response to signals from bin-level indicators, process-alarms, scales, load cells, ball mill or crusher drives.

Speed and Accuracy Combined
Three separate Amplitrol Feeders are controlled simultaneously with the control panel shown above. Used in a batch weighing system, the controls produce a fully adjustable high-low feed rate cycle for each feeder. For maximum batching speed with minimum batch variation, Amplitrol feeds the major portion of a batch at torrent rates—the remainder at a dribble. Shutoff at proper weight and recycling is automatic.

For more information, write Carrier Conveyor Division, CHAIN Belt Company, 213 North Jackson St., Louisville 2, Ky.

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CHAIN BELT COMPANY

CONVEY • FEED
DEWATER • SCREEN
COOL • DRY
SCALP • COAT
DISTRIBUTE • ELEVATE

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PEOPLE IN THE NEWS

(Continued from page 37)

OBITUARIES

Ralph B. Thrush, retired plant manager of the Milwaukee, Wis., plant of Universal Atlas Cement Div., U. S. Steel Corp., died July 21. He was 69 years of age and had been manager of the plant for nearly 30 years.

Born in Rochester, Ind., Mr. Thrush joined the Buffington, Ind., plant of Universal Atlas in 1922. He went to Milwaukee in 1931 to supervise construction of the Atlas plant and remained as manager. He retired in 1955.

Ted E. McGrath, chairman of the board of directors of the McGrath Sand & Gravel Co., Lincoln, Ill., which he helped to organize in 1908, died June 23 after a long illness. He was 76 years of age. Mr. McGrath was a past director of the Illinois Chamber of Commerce and a member of the U. S. Chamber of Commerce. He was also a director of the Lincoln Chamber of Commerce.

Edward A. Harris, vice president of operations, Aetna Portland Cement Co., Bay City, Mich., passed away June 28 after a week's illness. He was 68 years old and had been associated with Aetna since 1929.

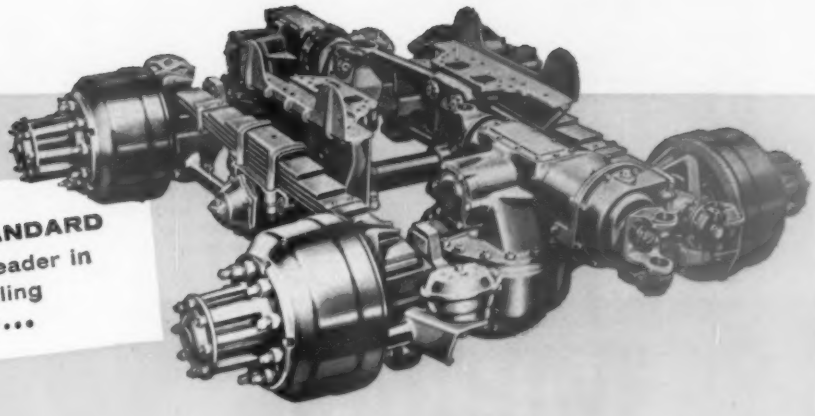
Robert G. Fuller, superintendent of the Williamsville plant of Buffalo Crushed Stone Corp., Bowmansville, N. Y., died suddenly on July 9. He was 46 years old.

James R. Evans, general manager and superintendent of the Alfred-Atlas Gravel & Sand Corp., Alfred, N.Y., for 32 years prior to his retirement two years ago, died May 13 following a long illness. He was 73 years of age.

George W. Doran, a director of the Ohio Gravel Co., Cincinnati, Ohio, and a former owner of the old Cincinnati Quarries Co., passed away May 12 at the age of 92.

Donald Meek, senior vice president of Pacific Cement & Aggregates, Inc., San Francisco, Calif., died May 4 after a brief illness. He was 72.

END



ROCKWELL-STANDARD
Acknowledged Leader in
Rugged Hauling
Operations...

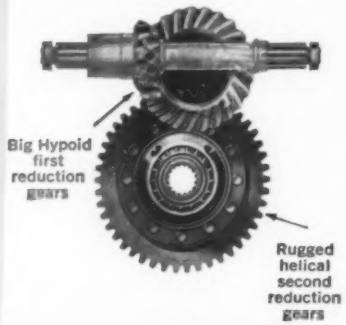
Here's why Timken-Detroit®

DOUBLE-REDUCTION TANDEMS LEAD IN TOP PERFORMANCE—LONG LIFE!

Timken-Detroit Heavy-Duty Tandems with Hypoid Helical Double-Reduction Gears are the big favorites for top performance and long life.
Here are some of the reasons why:

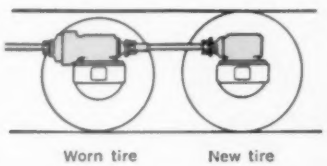
Rugged Hypoid-Helical Double-Reduction Gearing!

Balanced gearing—with two full-sized gear sets working in series to take an equal share of the load—provides a stronger power train with balanced gear set loadings and the widest range of ratios.



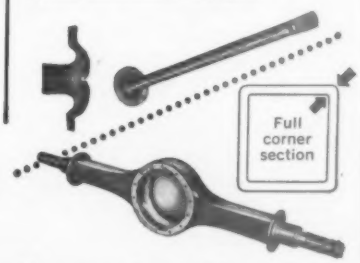
Driver Controlled Interaxle Differential!

Allows differential action between the axles to compensate for worn or mismatched tires. Both axles do equal amounts of work . . . can be disengaged at any speed, giving positive through drive when better traction is needed. *Straight-Line Through Drive* eliminates prop shaft angularity . . . increases bearing and gear life, reduces maintenance.



"Torsion-Flow" Axle Shafts and Hot-Forged Housings!

More splines, Torsion-Flow forging, and patented heat-treating processes make Rockwell-Standard shafts the toughest in the industry. Housings are hot-forged from high carbon steel, and are rectangular shaped with full strength corners for greatest strength with minimum weight.



Timken-Detroit Double-Reduction Tandems come in a wide range of capacities—6 models from 34,000 to 65,000 pounds.

Another Product of...

ROCKWELL-STANDARD CORPORATION

Transmission and Axle Division, Detroit 32, Michigan

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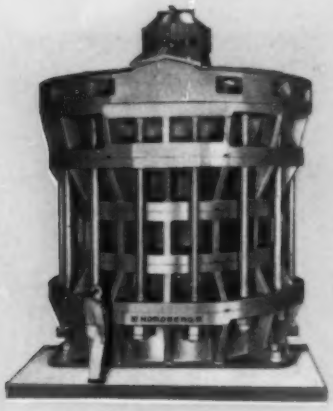
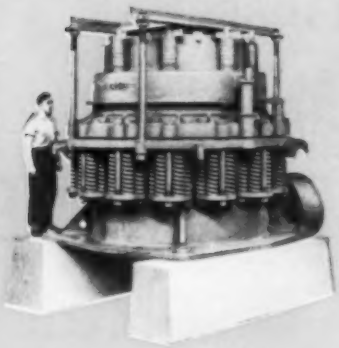


SYMONS® PRIMARY GYRATORY CRUSHERS

These gyratory crushers are built for big tonnage, heavy duty primary breaking in 30″, 42″, 48″, 54″, 60″ and 72″ feed opening sizes, for capacities up to 3500 or more tons per hour.

SYMONS INTERMEDIATE CONE CRUSHERS

General duty machines for producing large quantities of product material with a minimum of fines, from fairly uniform feed, requiring a reduction of only one or two sizes. Available with 22″ and 30″ crushing heads, in capacities to 100 tons per hour.

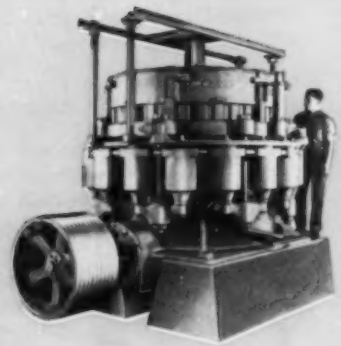


SYMONS CONE CRUSHERS

For secondary and finer reductions, Symons Cone Crushers, in both Standard and Short Head types, are built in sizes ranging from 22″ to 7′ in diameter, for capacities from 6 to 900 or more tons per hour.

NORDBERG GRINDING MILLS KILNS AND COOLERS

To meet specified conditions for wet or dry processing in the manufacture of cement and numerous other processes where friable material must be comminuted to fine sizes. Mills include Rod, Ball, Pebble, Tube and Compartment types in sizes from 8′ to 13′ diameter and up to 50′ in length.



NORDBERG GYRADISC® CRUSHERS

Built to supplement the world-renowned Symons Cone Crushers, the Nordberg Gyradisc provides a medium for the profitable production of sand sizes of specification material.

NORDBERG ENGINES

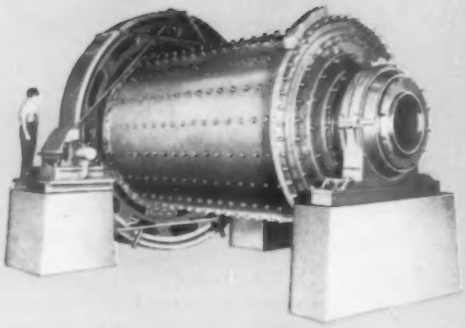
Ranging from small "packaged" power units to large stationary engines for base load and standby power, Nordberg engines are built in a wide range of types for Diesel, Dualfuel® and Spark-Ignition Gas operation, in sizes to over 11,000 horsepower.

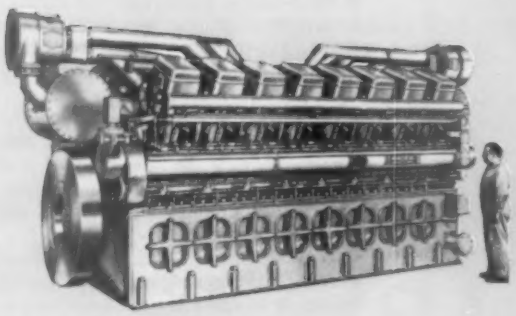
IN PORTABLE PLANT SERVICE

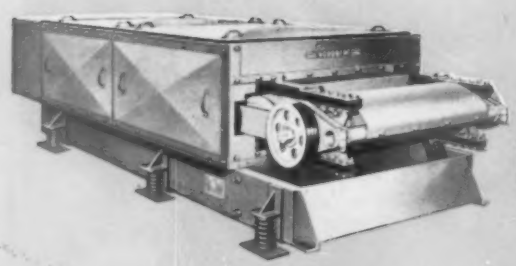
Increasing numbers of portable plant operators are now using Symons Cone Crushers for big capacity of fine product . . . such as this Cedarapids® portable intermediate crushing plant utilizing a 4′ Symons Cone Crusher.

SYMONS VIBRATING SCREENS AND GRIZZLIES

Built in a wide range of types and sizes to meet practically all sizing requirements from heavy duty primary scalping to many fine screening applications.







For the Construction Projects of the World

NORDBERG MACHINERY

produces BIG TONNAGES of Specification Aggregate Bituminous Materials Crushed Sand and Cement

NOW—more than ever before—as you plan production to meet steadily increasing demands for big tonnages of specification aggregate, bituminous materials, crushed sand, and cement—*your best buy is Nordberg*. Here is machinery that is used throughout the cement, aggregate and construction industries for maximum, continuous production at lowest possible cost.

With dependability proved through use, Nordberg machinery is on the job wherever in the world leading producers and contractors are engaged in the construction of highways, dams and hydro projects, bridges, as well as commercial and residential buildings.

Whether you are a contractor, operator, construction superintendent or design engineer, you will find it profitable to specify and use Nordberg Crushing, Screening and Grinding Machinery for stationary and/or portable service.

NORDBERG MFG., Milwaukee 1, Wisconsin

SYMONS . . . a registered Nordberg trademark known throughout the world.

NORDBERG

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Q-159

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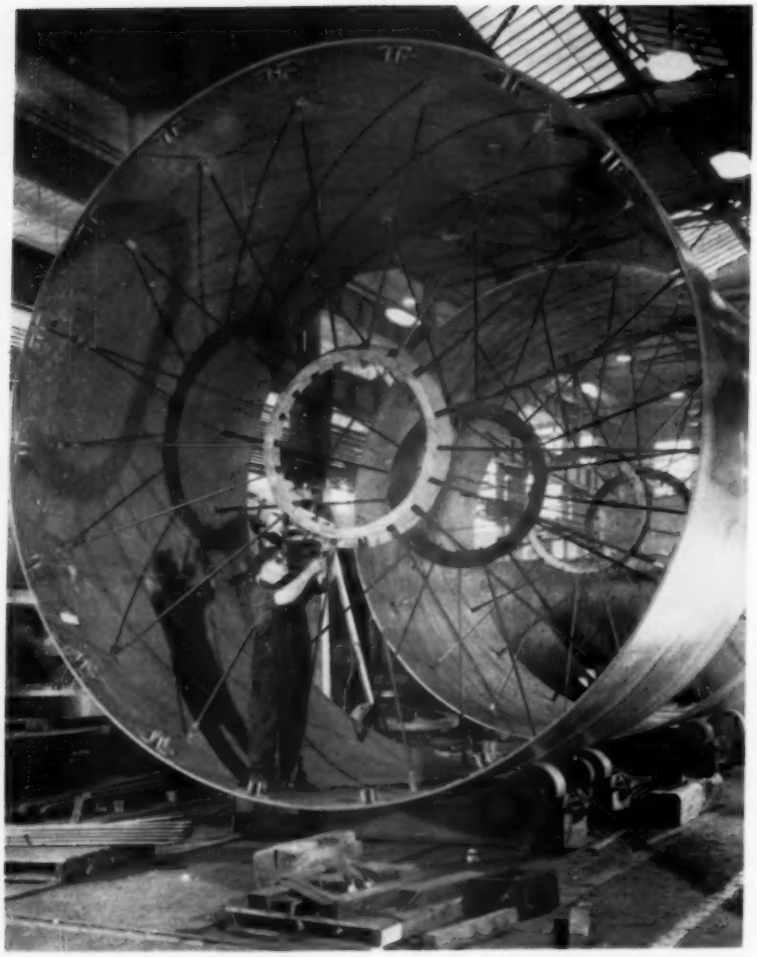

Attachment of temporary support spiders was part of the process of getting kiln sections ready for shipment to Loma Negra. Adjustment of the rods, being done here, is a precision process in itself

Shipping kiln to Argentina is a mammoth undertaking

PORT HISTORY WAS MADE in Milwaukee and pages were added to the histories of the cement and shipping industries too, when the Mormacpride took a 600-ft. rotary kiln on board for delivery to Loma Negra S.A. Compania Industrial Argentina. The shipment was memorable for the following reasons:

- Loading of the cargo aboard ship was accomplished at the point of manufacture, thanks to the St. Lawrence Seaway which makes it possible to ship from Great Lakes ports.
- The $10-million ship, owned by Moore-McCormick Line, was making its maiden run. To unload its cargo in Argentina, it was equipped with extra-heavy capacity booms.
- The kiln, shipped in 59 sections, is described as the largest wet-process rotary kiln in the Western Hemisphere. Manufactured by Allis-Chalmers Mfg. Co., it will have a capacity of 12,000 bbl. per day.
- Special provisions for unloading the kiln were made at Necochea, Argentina. A new slip was dredged and a spur was built for a railroad siding. From Necochea, the kiln went by rail to Barker for assembly.
- The cement company that is installing the new equipment, Loma Negra, is engaged in a $7.2-million expansion program. The new kiln, 600 ft. long and with a diameter of 18½ x 17x18½ ft., will increase its yearly cement production by 3.9 million bbl.

(Continued on page 46)

There she goes into the hold. Gently lowered into the Mormacpride's hold is one of the kiln sections, 18½-ft. diam. and weighing about 20 tons

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SMALL PLANTS:

open new markets!

with an Eagle fine material screw washer

With an Eagle Fine Material Screw Washer-Classifier-Dehydrator on the job, you can upgrade your product—meet specifications—open new markets—and frequently sell at a higher price. An Eagle Fine Material Screw Unit will wash your sand clean and retain or remove fines as required to give you the sand you need. Can handle concrete sand, mortar sand, plaster sand or finer sands. If you have the material in your deposit an Eagle Fine Material Screw will get it ready for market quickly and at lowest cost per ton.

The small, single screw fine material unit shown above, has been doing a good job producing alternately concrete and mason sands for L. A. Demers, Winooski, Vermont, for several years.

Send a 10 lb. sample of your pit run material to us and let our engineers run a free test to determine what an Eagle Washer could do for you. Send for Catalog 58.

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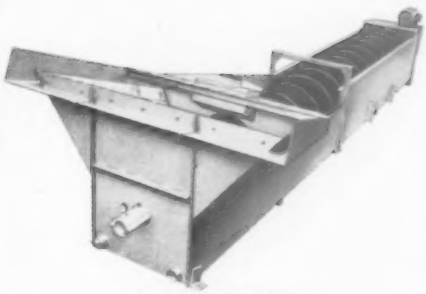
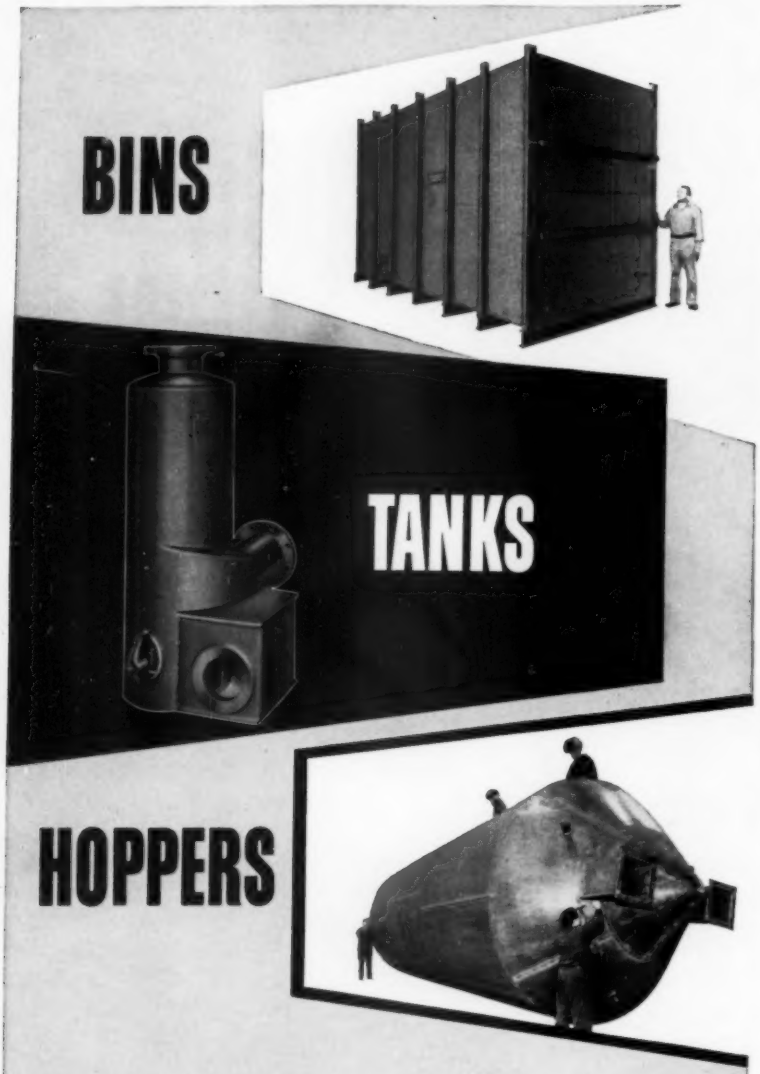


EAGLE SINGLE SCREW WASHER-CLASSIFIER-DEHYDRATOR

Eagle's years of experience are evident in its design and performance. Large settling pool. Baffled feed box reduces turbulence and feeds in material at optimum location. Totally enclosed gear drive runs in oil bath. A capacity for every need.

EAGLE DOUBLE SCREW WASHER-CLASSIFIER-DEHYDRATOR

Have double the raking capacity of single screw units. Long three-sided overflow weir easily adjusted for retaining or wasting fines. Lower bearings water lubricated under pressure, as with all Eagle Washers. Trouble-free, profitable production assured.



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Plant facilities will accommodate sheet, plate and structural to ½" thicknesses. Overhead crane capacity to 25 tons handles the big jobs easily.

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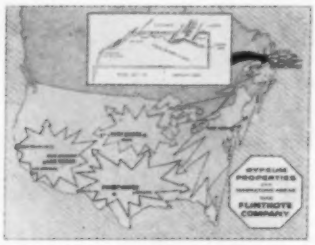
(Continued from page 44)

Portland cement production

PRODUCTION OF FINISHED PORTLAND CEMENT in May 1960 totaled 31.8 million bbl., reports the Bureau of Mines. This was a decrease of 5 percent, compared with May 1959. Mill shipments for the month totaled 30.2 million bbl., down 9 percent from the year-earlier period. Stocks of finished portland cement on hand May 31, 1960, at 40 million bbl., were 10 percent higher than they were a year ago. As for clinker production, it was 3 percent lower this May than last—30.9 million bbl. The figures were reported by 172 plants in 37 states and Puerto Rico.

Flintkote acquires gypsum deposits in Newfoundland



THE FLINTKOTE CO., New York City, has reached an understanding with the Province of Newfoundland for acquisition of gypsum reserves on that island. The company will have immediate access to 40 sq. mi. of gypsum producing properties at Flat Bay and subsequently to 3,000 sq. mi. on which there are indicated gypsum reserves of at least 200 million tons.

As part of its understanding with the Province, Flintkote will acquire certain assets of Atlantic Gypsum Co. Ltd. at Corner Brook, Nfld., for $1 million. Among the assets are material and equipment to build a 6-mi. aerial conveyor from the existing gypsum quarries at Flat Bay to a deep-water shipping point near St. Georges, together with a pier and shipping facilities. Atlantic Gypsum has a 40,000-tpy. gypsum producing plant in Newfoundland which Flintkote will manage, with option to purchase outright.

In connection with the above announcement, I. J. Harvey, Jr., Flintkote's chief executive officer, revealed that the company also has an option on some gypsum properties at Fort

(Continued on page 52)

Enter 1297 on Reader Card

After 20,000 hours of trouble-free power "Old Faithful" retired by new UDT-817!

An International UD-24 engine—called "Old Faithful" by her owners—has racked up 20,000 hours of continuous trouble-free performance on a rock crushing job in Kansas. That's an average of nine hours per day for six years! At 13,000 hours a gasket had to be replaced, but there have been no major repairs. The operation, owned by Roy Baker of Valley Falls, produces 900 cu. yds. of crushed rock daily with a 32 x 40 Universal crusher.

Partners in the company, Mike and Bert Baker, say, "We decided to retire our old faithful UD-24 after it had piled up nearly 20,000 trouble-free, hard-working crushing hours. The new UDT-817 was chosen because of its greater power, direct starting and easy installation. Fuel consumption on the 817 is low, considering the power we get. And with all that power we can eliminate secondary crushing by just reducing the jaw opening."

Roy Baker says, "Of course I bought another International!" And that about sums up the attitude of contractors all over the country—they know from experience that Internationals stand up under heaviest work, are immune to dust and grit—and will pay back the investment faster than any other.

Check with your International Engine Distributor or Dealer soon, and find out how little it costs to power —or repower—your equipment with International engines. See the full line of engines and power units—16.8 to 385 max. hp.

INTERNATIONAL® ENGINES

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

"'Live track' power steering rock...SO WE KEEP OUR TD-25

—Asheville Contracting Company,

Shale and blue granite rock make up 85% of the 550,000-cu. yd. of roadway excavation on this contract —5.18 miles of Blue Ridge Parkway construction, for the United States Department of Interior.

That's why Asheville Contracting Company places maximum reliance on their "rock-movers' special": king-sized International crawler power! Where the going's too tough or job progress is too slow and costly with big clutch-steered crawlers, "Asheville's" new 230-hp TD-25 and two veteran TD-24's take over—and "run interference."

"International 'live track' power steering moves more dirt and rock," states M. H. Reighard, Superintendent of rock operations for "Asheville." "Therefore, we keep our TD-25 and TD-24's on trail-blazing and pioneering. The 'live track' feature keeps the blade in the material and makes steep work safer. TD-25 balance enables working 'almost straight up' on mountainous terrain."

Exclusive, years'-proved International Planet Power-steering gives you full-time live power on both tracks to handle full loads on turns as well as straightaways. Load-limiting "dead-track drag" is eliminated. And

moves more PIONEERING"

Asheville, No. Carolina

"live track" power-steering is combined with on-the-go, Hi-Lo power-shifting that lets you match power to load instantly, for full-speed cycles. You do away with time-wasting "gear-shift lag!"

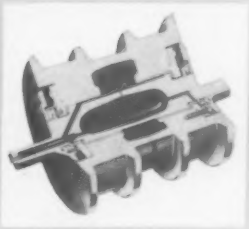
New TD-25 seven-roller tracks are strength-matched to the full effort of the high-torque, 230-hp turbo-charged Diesel engine! The "25" is platformed on shock-resistant, double-box-beam track frames—smoothly carried on International's dual-protected Dura-Rollers, the track rollers that make 1,000-hr. lube intervals practical!

As standard equipment at no extra cost, the TD-25 gives you exclusive, combined Planet Power-steering and Hi-Lo on-the-go power-shifting. And you get this work-speeding design advantage in torque-converter or direct drive model. Here, Asheville's "25" operator is ready to "shift-up" to keep the load on the move.

Power-steer and power-shift the TD-25 with king-sized loads—around curves, upgrade, anywhere! Compare planet-powered "25" ability to deliver full-load capacity, full-time—to outearn other big rigs up to 50%—blading rock, benching, push-loading, mass-production dozing (where fast reverse and decelerator action count), ripping shale! Let your International Construction Equipment Distributor demonstrate!

Even with an enormous offset load of shot-rock there's no "bank-nosing;" no sluing. The TD-25 operator simply operates the load-side track in high-speed range—the other track in low-speed range. Result: full-capacity, straight-ahead performance—the same as the "25" gives on benching, bank-cutting, or side-casting!

Heavy-duty TD-25 Dura-Rollers feature thick, deflection-proof shells; full-floating, precision fitted seals; king-sized lube reservoirs; and exclusive pressure-relief passages that protect seals from overlubrication. These minimum-maintenance track rollers give you practical 1,000-hr lubrication intervals!



International® *Construction Equipment*

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Ill.
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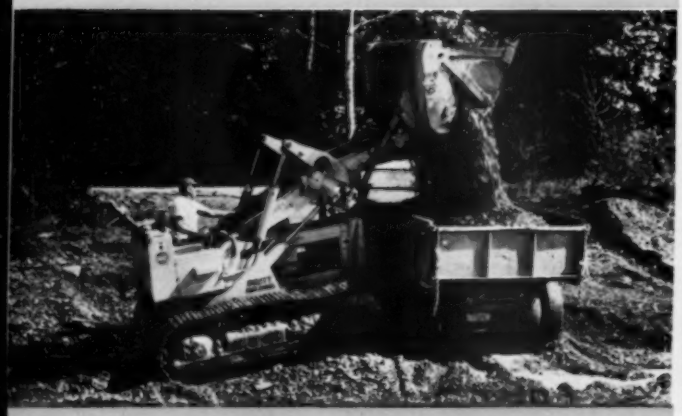
OWNERS REPORT:

How exclusive clam-action 4-in-1 MAKES MONEY where other rigs don't!

"4-in-1 break-out action saves time and shooting costs"

—Albert Boehman Coal Mine, St. Meinard, Indiana

Albert Boehman Coal Mine uses an International Drott TD-6 Four-in-One to strip overburden, clean the vein, and load out coal. "I particularly like the 4-in-1's (pry-over-shoe) break-out action which heap-loads the bucket fast, and usually saves 'shooting' costs. The 4-in-1 has the work-producing features of several machines in one." Here his TD-6 Four-in-One is "digging coal" directly from the vein it uncovered and cleaned. The 1⅛ cu. yd. TD-6 can apply a tremendous 18,600 lbs. of break-out force!



"Bottom-dumping 4-in-1 cleans itself out"

—Marion Young, Bloomington, Indiana

"I tried another rig for a month and had to clean out its bucket with a spade—and that slows you down with 600 to 700 lbs. of dirt stuck in it," states excavating-loading contractor Marion Young. "My bottom-dumping 4-in-1 cleans itself out when I flap the clam (hydraulically)." Here his 4-in-1 is loading wet river-bottom gravel. Exclusive 4-in-1 bottom-dumping eliminates the sticky materials problem!

"Our 4-in-1 replaces several other rigs"

—Joseph Borge & Sons, Inc., Swansea, Mass.

Joseph Borge & Sons, Inc., produce washed sand and gravel from open pits—use their TD-15 Four-in-One to strip overburden, load out, and recontour worked-out pits. Owner reports loading out 1,200-1,800 tons of material per 8 hrs. "Four-in-One versatility and capacity replace several rigs for us," states Vice-president, George Borge. "The clam-action also digs faster and dumps cleaner." Above, their 4-in-1 is "back-dragging" from gravel bank, to speed loading.

Why limit your income to what an old-style, single-action loader, or any other limited-duty rig can earn you? See how an International Drott 4-in-1 can give you a whole equipment spread of actions—and each action can double for one or more costly specialized machines. Prove Hydro-Spring performance protection. See your International Drott Distributor for a 4-in-1 demonstration!

International Harvester Company, Chicago 1, Illinois
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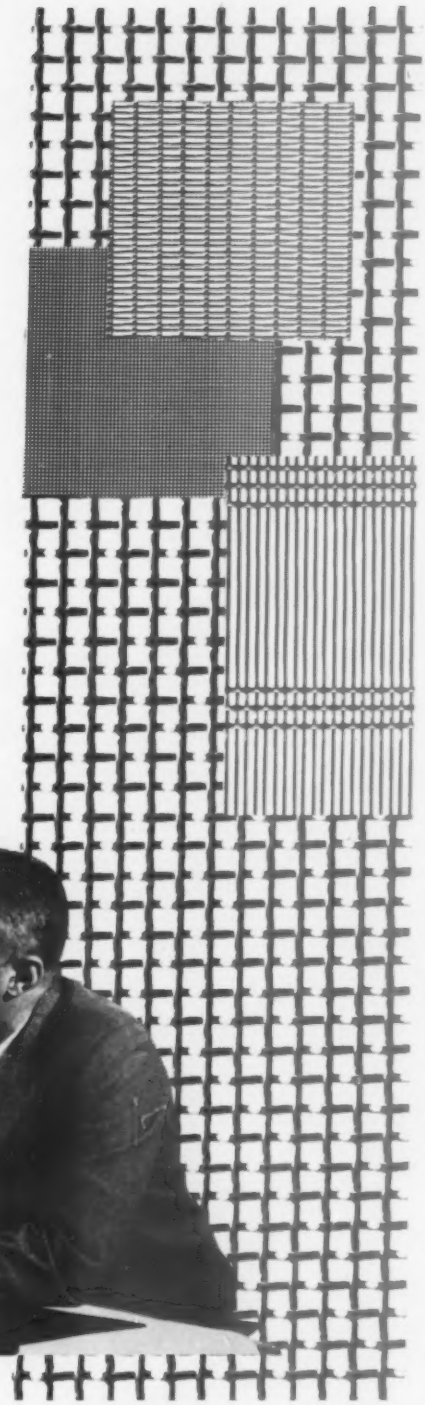
That's *Tyler Screening Service*—use it to cut your production costs.



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No guessing or gambling on your part. Your Caterpillar Dealer reconditions, classifies and warrants most of his used units. You know what you're getting . . . and you're protected . . . with these three types of buys:

1 **A "BONDED BUY"** Cat-built machine, the most productive used equipment you can buy. Carefully checked, it is backed by his written bond up to $10,000, assuring you parts and service protection for the warranty period.

2 **A "CERTIFIED BUY"**—a written warranty covering units of any make in good condition.

3 **A "BUY AND TRY"** deal—a written money-back agreement on machines not in the above two classifications.

Only a Caterpillar Dealer will provide you with "Bonded Buy" protection. He backs his machines with prompt service and parts you can trust. Look him up in the Yellow Pages . . . look over the machines in his used equipment lot. You'll find the best buys in the market there!

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.

CATERPILLAR

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BEST USED EQUIPMENT BUYS ANYWHERE

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(Continued from page 46)

Dodge, Iowa. He said the company plans to construct at least three gypsum producing plants along the Atlantic seaboard and the St. Lawrence River, and that the Fort Dodge property "will support another new plant for serving that important area."

What's coming in October

Agricultural gypsum was one of the original soil sweeteners, but its use declined as building products became a more profitable use. A California producer has built a thriving business for an unusual gypsum deposit.

Wall Street Journal quoted George J. Pecaro, Flintkote president, as saying that construction of the first new plant, in the New York area, will begin in the near future, with completion scheduled in about 18 months. It will cost about $7.5 million. On the map (page 46), planned facilities and their market areas are indicated by broken lines.

Forum on future of lightweight aggregate

"What's in View for Lightweight Aggregate?" was the theme of a forum discussion at the midyear meeting of The Expanded Clay and Shale Association, held at the Dearborn Inn, Dearborn, Mich., in July. B. K. Powers headed this discussion in which a wide field of new and promising applications for lightweight aggregates was explored. Particular emphasis was placed on what Mr. Powers termed the "great possibilities for lightweight aggregate in the clay-bonded units now coming in for so much attention."

Mr. Powers, vice president of Virginia Lightweight Aggregate Corp., Roanoke, said that lightweight aggregates can expect an important market from this area of use, provided manufacturers take the initiative, do preliminary work and development so that block producers may be informed and interested.

The above was one of several informative sessions at the two-day

(Continued on page 56)

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All-Americans for a Winning Materials Handling Team

These three championship performers give you a materials handling team that is unbeatable... All-American from the basic steel—through the drawing of the wire—to the finished wire rope product.

All-American No. 1 — Whyte Strand Wire Rope. Inspires other members of your team, brings out the best in them for maximum production at lowest cost. (Write for bulletin 6025.)

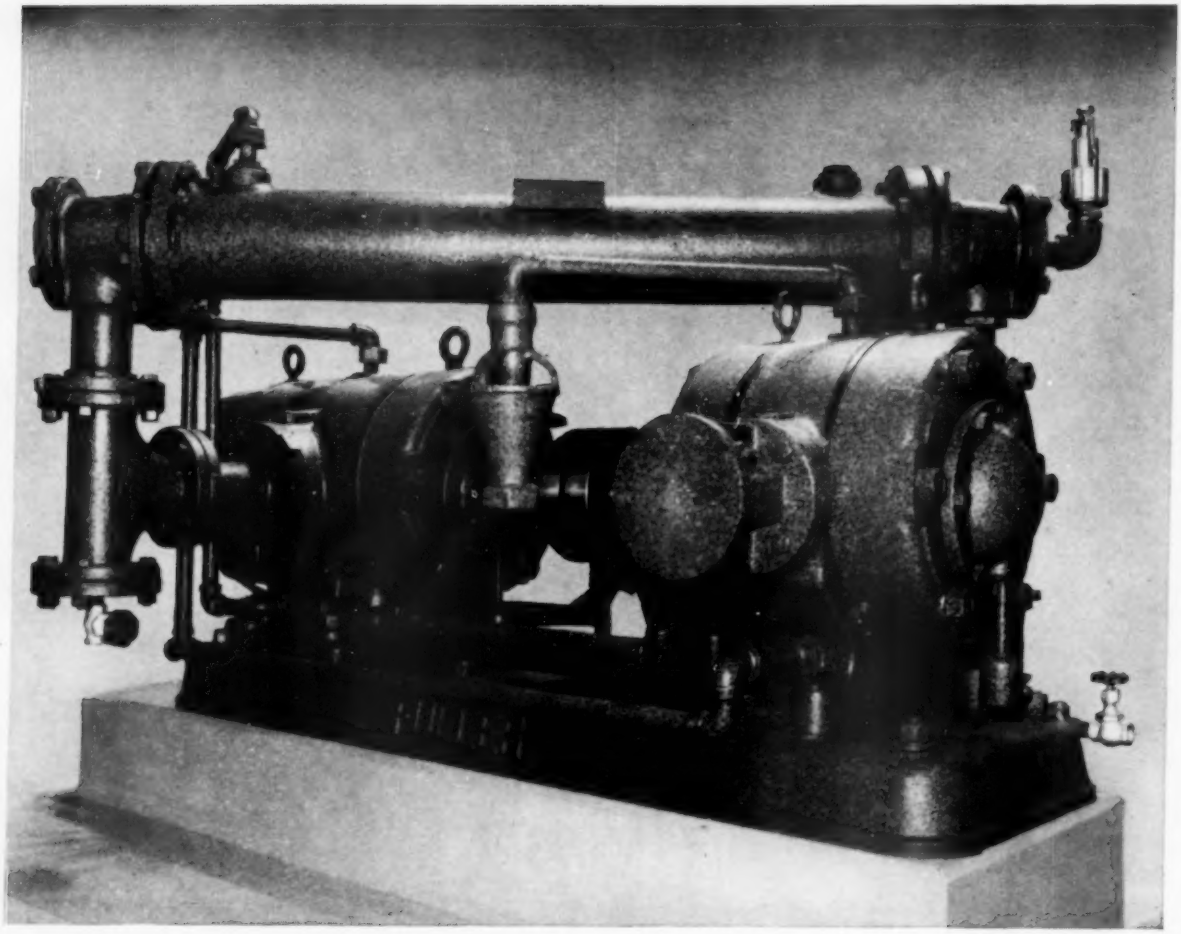
All-American No. 2 — The Atlas Sling for the safety spot — lifting and carrying all kinds of loads. Flexible, braided construction provides constant championship performance with unquestioned safety. (Write for bulletin 5308.)

All-American No. 3 — Macwhyte Safe-Lock Cable Assemblies are a triple-threat specializing in uniformity, appearance, and agility... for manufactured products and equipment components requiring the positive performance of a custom-made cable assembly. (Write for bulletin 5601.)

In addition to their outstanding performance on the materials handling and production fields, each one of these All-Americans lives up to these championship qualifications: *Dependability* that is the result of constant uniformity, maintained by rigid quality controls at every step of manufacture. *Experience* that pays off in high production scores... and game-winning play with other members of your equipment team specializing in American rules of the game. *Availability* guarantees the right player for every play, whether at the factory or the warehouse... backed up by expert engineering service. *These All-American products are completely made in the U. S. A.*

Start now to build up your All-American materials handling team. Your Macwhyte representative will be glad to coach your selections.

MACWHYTE Wire Rope COMPANY



Fuller Compressors With Overhead Intercoolers Offer A New Dimension In Compactness

Fuller Rotary Two-Stage Compressors equipped with Overhead Intercoolers fill the bill where space may be a problem. These compressors produce from 30 to 3300 cfm, pressures to 125 lb. gage and can be readily installed.

These compact Rotary Compressors are vibration-free, thereby eliminating the need for involved and expensive foundations or structural modifications.

The Fuller rotary principle permits complete freedom of reciprocating parts—valves, crankshafts, pistons—cutting the need for frequent servicing and parts replacement. Minor maintenance is all the care indicated for years of serviceability.

For full details on the maintenance-free economy and high performance of Fuller rotaries, write today for comprehensive, illustrated Bulletin C-5A. 2626 C359

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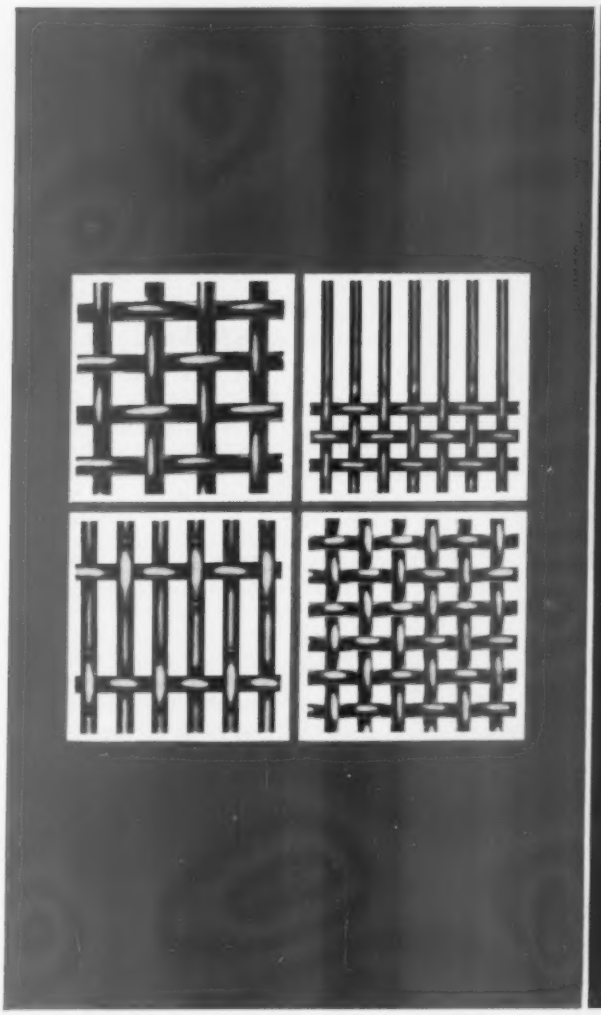
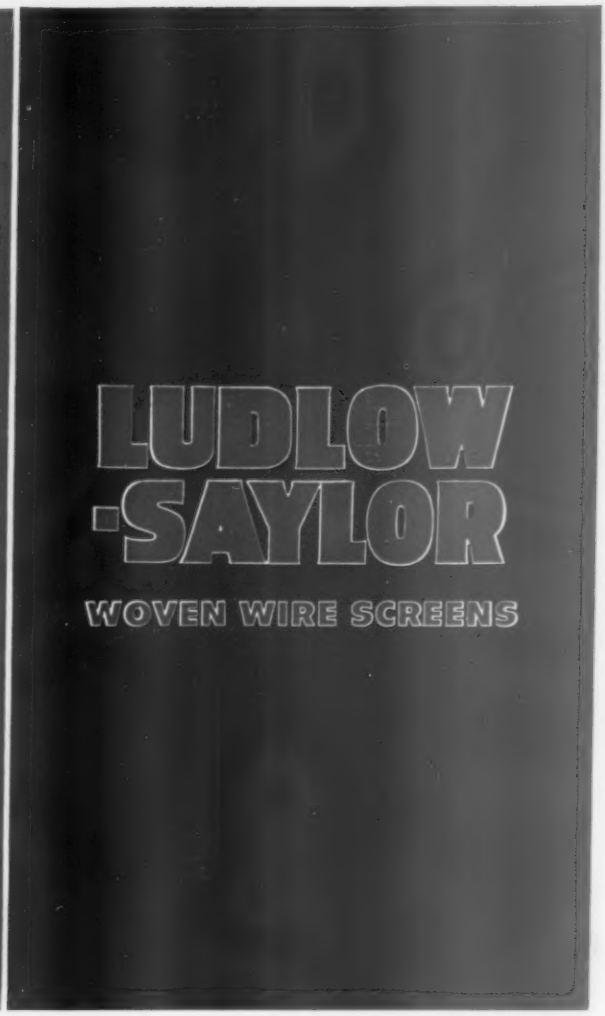
These longer-wearing, profit-making screens should cost more, but don't. Specify, insist on Ludlow-Saylor next time you order replacements.





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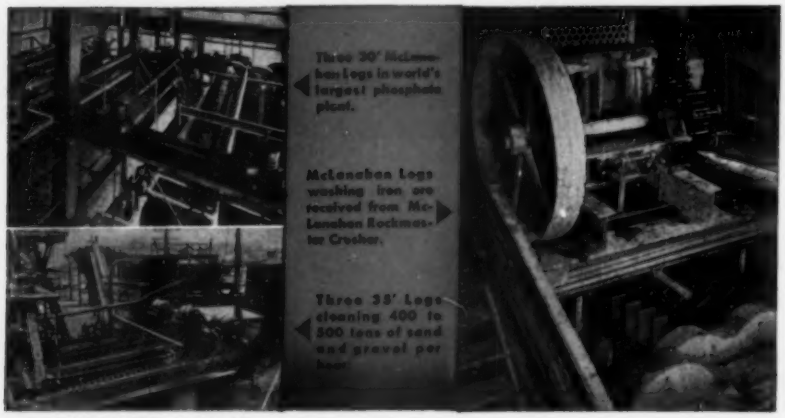
Three 30' McLanahan Logs in world's largest phosphate plant.
McLanahan Logs washing iron ore received from McLanahan Rockmaster Crusher.
Three 35' Logs cleaning 400 to 500 tons of sand and gravel per hour.

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(Continued from page 52)

meeting. Key figures at the conclave were Ronald G. Hardy, Syracuse, N. Y., president of ECSA; Melvin G. Cruzen, general manager of Light Weight Aggregate Corp. of Livonia, Mich., whose firm was host to the meeting; Lucas E. Pfeiffenberger, technical consultant for the association; and T. R. Berger, executive secretary.

In addition to being brought up to date on technical developments in the industry, members attending the meeting also toured two plants. They visited the plant of Light Weight Aggregate Corp., where Beslite is produced, and inspected the sintering plant of Great Lakes Steel Corp. in Detroit.

ECSA will hold its annual meeting next February in St. Louis in close proximity to the American Concrete Institute sessions in that city.

Toledo Plaster & Supply merges with Nicholson Co.

TWO TOLEDO, OHIO, FIRMS—Toledo Plaster & Supply Co. and Nicholson Concrete Co.—are merging. The consolidated organization, headed by J. A. Nicholson, president, will have a new name: Nicholson Concrete & Supply Co. Harry N. Hanson, long associated with Toledo Plaster & Supply, will be chairman of the board.

Toledo Plaster was established in 1901; Nicholson Concrete in 1936. The new organization has a complete building supply service, including ready-mixed concrete. It has taken over the Woodville Road property of Hirzel Coal & Building Supplies as a location for a ready mix plant, it was also announced.

Pope brothers charged with violation of securities laws

ANTHONY AND FORTUNE POPE, president and executive vice president of Colonial Sand and Stone Co., Inc., New York, were indicted by a special federal grand jury on charges of conspiring to violate U.S. securities laws. In a 12-count indictment, they were charged with diversion or concealing the diversion of at least $375,000 of Colonial Sand's funds into companies owned or controlled by the Pope family for their own ultimate benefit.

The two men, together with a family foundation, control Colonial Sand by holding more than 60 percent of

the outstanding common stock. The seven companies into which Colonial Sand's funds were said to have been diverted were named by the indictment as co-conspirators, but not as defendants. These did not include one of Colonial Sand's subsidiaries—Hudson Cement Co., Kingston, N. Y.

The Pope brothers, in a special meeting of Colonial Sand directors, said the federal charges were without merit, but that $405,817 is being returned to Colonial Sand as the gross amount derived from transactions cited in the indictment.

Future expansion sites purchased by Marquette

MARQUETTE CEMENT MANUFACTURING CO., Chicago, Ill., has purchased raw material deposits in Glen Haven, Wis., and Austin, Texas, as future cement plant sites. It also announced that it was buying a similar deposit at an undisclosed location in extreme southern Georgia, and had bought property at St. Paul, Minn., for a distribution plant.

W. A. Wecker, president, said Marquette would build cement producing and distributing facilities at these locations when rising demand provides economic justification for them. As yet, there is no timetable on construction. Marquette presently produces 17 million bbl. of cement annually at ten producing plants.

Shareowners were told that the board has authorized an additional $2¼ million of capital expenditures for plant improvements. This brings authorized work to a total of nearly $15 million, of which better than $10 million will be spent this year. Some of the improvements: a complete electrical dust precipitation system, along with dust recovery and alkali leaching facilities, and bulk and bag truck-loading system at Des Moines, and increased storage silo capacity at Nashville.

(Continued on page 59)

What's coming in October

Cement imports is a lively topic for portland cement producers as well as for the users of cement. Joseph N. Bell will report the results of his recent survey into the situation.

PROFITABLE TONNAGES

of cleaner, drier product

Greatly improved drive with direct shaft mounted reducers . . . more effective performance in a broad range of operating conditions . . . heavier construction for longer service—these fundamentals make McLanahan Single or Double Screw washers your soundest buy.

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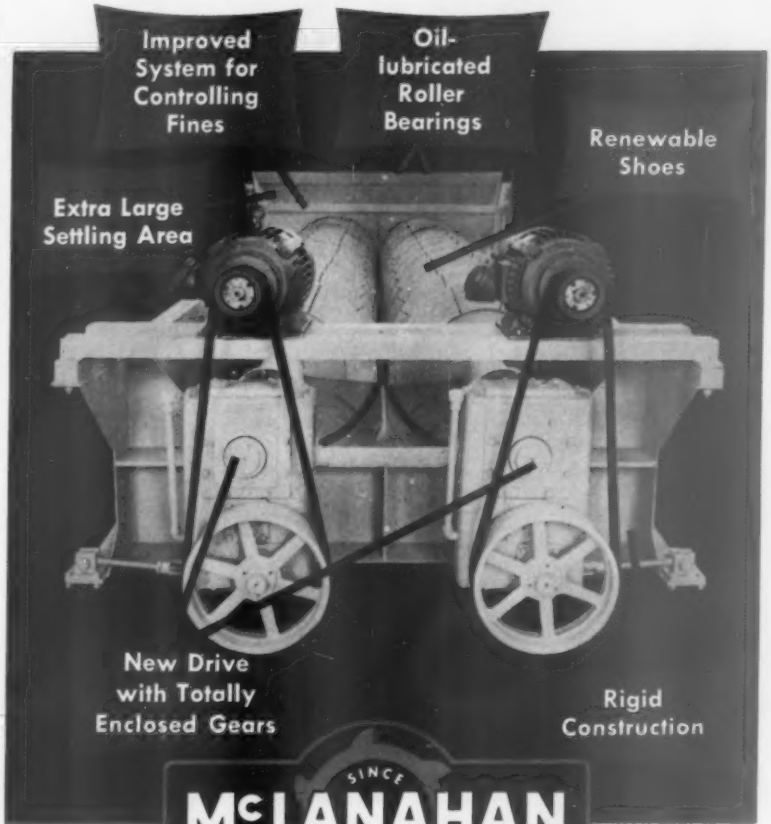

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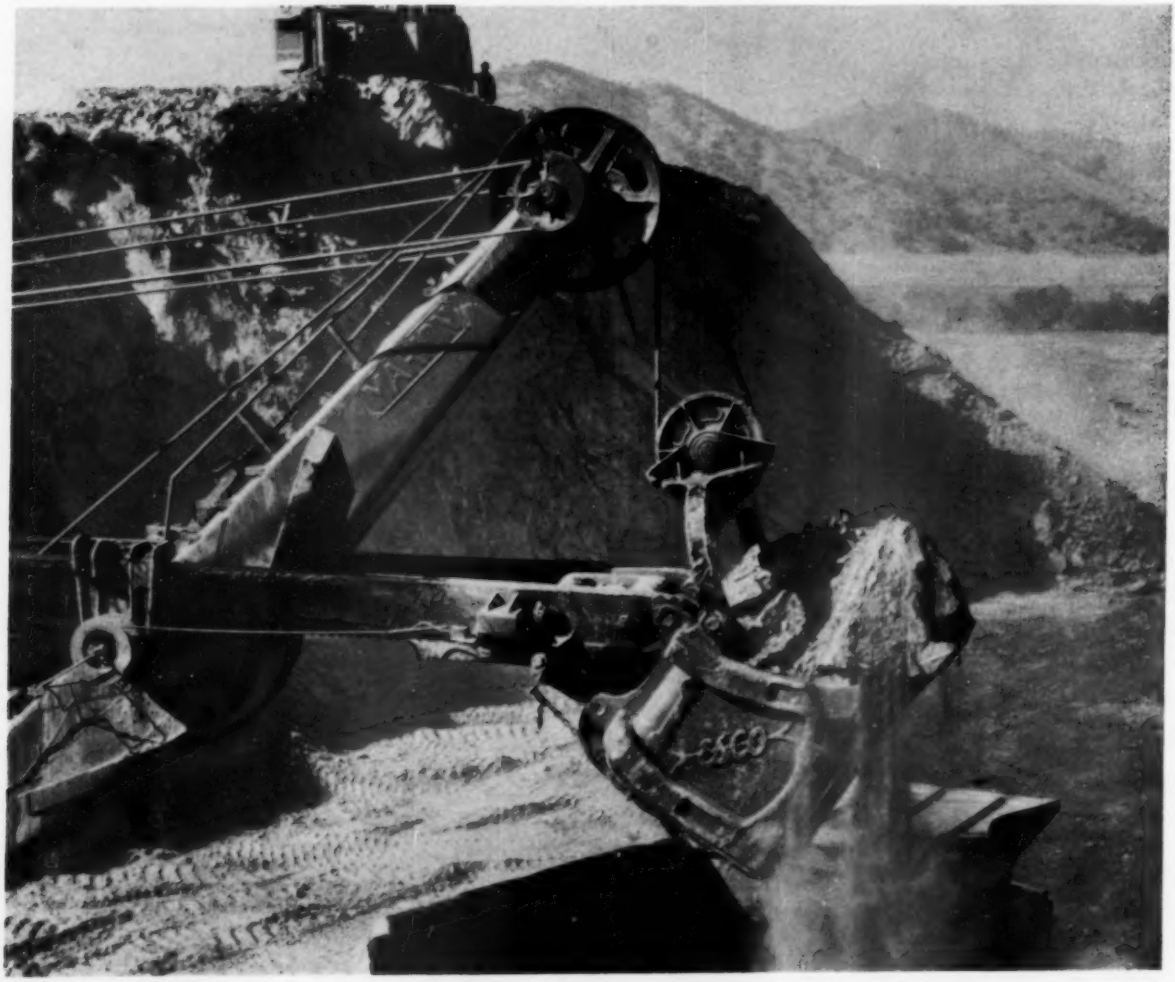
Dig, swing, dump. Dig, swing, dump. Day after day, year after year, rugged *ESCO* Shovel Dippers move mountains of tough rock and abrasive ore with far less downtime.

Whether your operation is strip mining, excavating, loading, quarrying or material rehandling, there is an *ESCO* Dipper designed for your machine that can increase your yardage, decrease your operating and maintenance costs. The *ESCO* line of dippers is the most complete of any manufactured. Dipper sizes range from ⅜ to 13 yards, and special custom tailored dippers can be made for your specialized digging jobs.

New ESCO wide cast-welded (WCW) and wide all-cast (WAC illustrated) Dippers feature wide-bite design. These streamlined dippers load faster, dump cleaner and last longer.



. . . and there goes **another** mountain!

See your ESCO dealer today for details, or write direct for your free copy of the ESCO Shovel Dipper catalog. You may also wish a copy of ESCO Fastback Hoe Dipper catalog.

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(Continued from page 57)

Sand screening, settling booklets are available

TWO BOOKLETS on sand preparation that were originally published as a service to ROCK PRODUCTS readers are still available and may be had by writing this magazine. Nathan C. Rockwood's "Screening Fine Materials," copyrighted in 1946, is an authoritative discussion of determining factors in the operating efficiency of vibrating screens.

Another volume, "Fundamental Principles of Sand Settling," (copyright 1929 and 1943) was written by the late Edmund Shaw as a practical guide to commercial sand producers. A limited number of these standard references still on hand will be given to individuals requesting them.

Pavement yardage

AWARDS OF CONCRETE PAVEMENT for the month of June and the first six months of 1960 have been classified by Portland Cement Association as follows:

	Sq. yd. awarded during: June	1st 6 mos.
Roads	5,784,164	31,895,851
Streets and alleys	4,000,380	15,104,305
Airports	1,283,998	3,634,425
Totals	11,068,542	50,634,581

Ohio Lime acquires United Cement Co.

ACQUISITION of the controlling interest in United Cement Co., Inc., Montevallo, Ala., has been announced by Ohio Lime Co., Woodville, Ohio. Terms of the agreement were not made public.

United Cement, formed in 1955, produces high-calcium lime and limestone products. It operates a rotary kiln lime plant and high-calcium limestone quarry at Montevallo. Ohio Lime, formed in 1916, operates a dolomitic limestone quarry, 36 shaft kilns for finishing lime and industrial dolomitic lime production, four rotary kilns for the production of dead-burned refractory dolomite and a stone drying and grinding plant.

Lehigh starts up new kiln at Alsen

LEHIGH PORTLAND CEMENT CO. started up a new kiln at its Alsen, N.Y., plant. Superseding four 125-ft. kilns installed in 1939, the new kiln is 11½x400 ft. Two kilns installed in 1953 will remain in operation.

Plant capacity is increased 180,000 bbl. per year by the new kiln. Other features of plant modernization include new raw and finish grinding mills, 20 new cement storage silos, scale house and hoppers for loading trucks, and a truck garage.

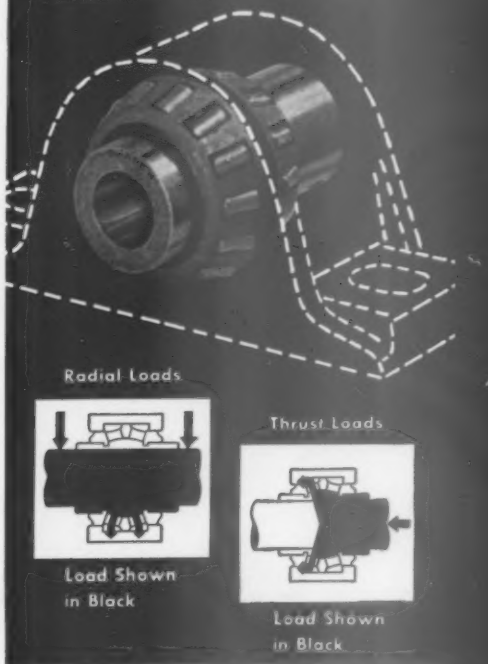
Push-type towboat undergoes performance trials

A 21,000-TON TOW OF BARGES loaded with crushed stone is pushed up the Hudson River in successful performance trials by the Rockland County. The 1,800-hp. vessel, first modern push-type towboat to operate on the Hudson, was built by Dravo Corp. for Cornell Steamboat Co., a subsidiary of New York Trap Rock Corp.

(Continued on page 61)

Another PLUS value...

RETAINS CAPACITY UNDER ANY LOAD



Shafer Self-Aligning Roller Bearings add plus life to your equipment, even under toughest conditions. Under radial or thrust loading, or ever-changing misalignment totaling 3°, Shafer Bearings retain full load capacity. All loads remain safely centered on the Shafer self-centering rollers—eliminating roller binding and end-wear—eliminating the need for a guide flange, a common source of wear. Mail the coupon.

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( ) Please send Shafer Bearing Catalog 59A.

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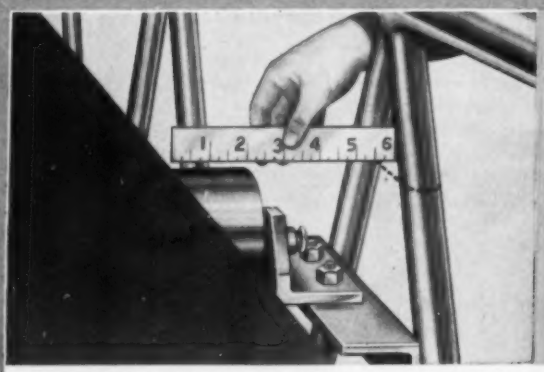
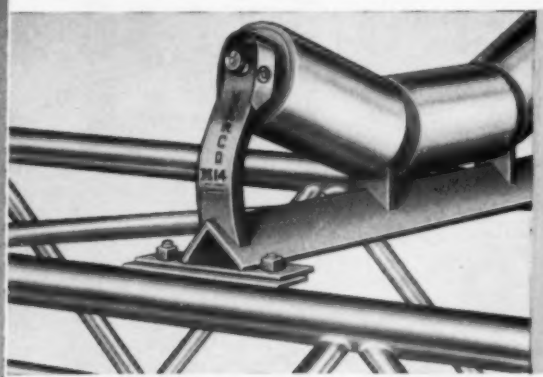
REDUCE BELT COSTS WITH MARCO TUBULAR FRAME CONVEYORS

Exclusive conveyor features increase belt life by offering maximum protection against edge damage

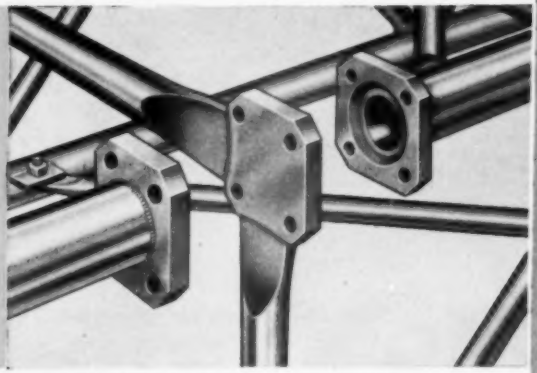


WIDER FRAME—MARCO Tubular Frames are widest in the industry. They provide 100% more space (5½") in the critical area—between belt edge and nearest frame member. Pedestal type return idler brackets are used, instead of hanger brackets that confine and damage belt.

WIDER FACE PULLEYS—MARCO is first with modern pulley specifications. 2" between belt and pulley edge—provides 100% greater protection than outmoded standards. Reduces possibility of belt destruction caused by "belt wandering" in high tension areas.



ALL TUBULAR MEMBERS—MARCO Tubular Frames are more rigid. Constructed of the strongest known structural member, these frames are modern—and resist material and water build-up. Sharp "belt cutting" edges are eliminated with this exclusive construction.



RIGID JOINT CONSTRUCTION—Another MARCO exclusive—4 bolts in each connection—16 in each joint. Not the usual 1 or 2 per connection. Joints are more rigid. Resists frame misalignment, simplifying belt training and increasing belt life.

Now, more than ever, conveyor belt represents the largest major repair or replacement expense in a conveyor installation. Realizing the extreme importance of this fact, MARCO has designed every conceivable belt saving idea into its Tubular Frame Conveyors.

MARCO is first to have all 4 of these proven belt protection features: a wider frame, wider face pulleys, all tubular members and the most rigid joint construction.

If wind, uneven loading, or factors beyond control should cause "belt-wandering", this exclusive conveyor design offers the operator the finest, most complete protection against belt "edge damage".

Increasing belt life by reducing belt "edge damage" is only one of the cost saving advantages in MARCO Tubular Frame Conveyors. Remember, your conveyors are not mere plant accessories—they deserve the attention of a specialized manufacturer offering modern specifications, carefully and properly designed to meet your most exacting requirements. For more information consult your MARCO Distributor or contact E. F. Marsh Engineering Co., St. Louis 10, Missouri.

*Trademark Reg.

MARCO

engineered MARCO products:

Tubular Frame Belt Conveyors • Conveyor Idlers • Solid and Self Cleaning Steel Pulleys • Bucket Elevators • Control Gates • Feeders • Bins

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(Continued from page 59)

Machinery on display at AMC mining show

LATEST MACHINERY will be displayed at the upcoming metal mining and industrial minerals convention and exposition of the American Mining Congress. To be held in Las Vegas, Nev., October 10-13, the mining show will utilize all inside display area of the new convention center, as well as adjacent outside areas required for showing of large equipment.

More than 180 manufacturers have contracted for display space, promising the most comprehensive display of mining, milling and processing machinery ever assembled in the West, said AMC officials.

Miron and Freres sold

A COMPLEX OF FIRMS in the construction materials field, Miron and Freres, Ltd., Montreal, has been sold to Cimenteries et Briqueteries Reunies of Belgium. Companies forming the Miron group include Miron Quarry Ltd., Canadian Quarries Ltd., Canada Concrete Products, Inc., Garva, Inc., Miron Construction Ltd., J. D. Sterling Ltd., Oka Sand and Gravel, Inc. and Canadian Perlite Corp. Last year, Miron and Freres completed a new cement plant at an estimated cost of $30 million.

Economists view nation's prospects for rest of year

MILES L. COLEAN, a Washington consulting economist, predicts that total spending on construction in 1960 will drop to about $55 billion, down two percent from 1959. Mr. Colean was one of five panelists who participated in a discussion of the nation's economic prospects, sponsored by the U. S. Chamber of Commerce.

Mr. Colean, noting that 1960 would reflect the first year-to-year decline since World War II, called it a "transitory phenomenon." The uptrend, he said, will resume in 1961.

There was a pessimist on the panel —Frank E. Morris, research director for the Investment Bankers Association of America. He said business prospects were "not bullish," adding, "I think the odds are very good that we will be in the downward phase of the business cycle within a year from now." Disagreeing with Mr. Morris' view were L. S. Hamaker, assistant vice president for sales, Republic Steel Corp., and Dr. Emerson Schmidt, the Chamber's economic research director. Mr. Hamaker said he can't buy the idea that a business downturn will start this year; he does not expect a decline in 1961, either. Said Dr. Schmidt: "The modest expansion that is under way should continue through the rest of the year and well into 1961."

Limelighter looks at steel situation

NATIONAL LIME ASSOCIATION'S news sheet, Limelighter, noted in June that steel manufacture was down to about 60 percent of capacity. However, impact on lime is lessened by growth of more high-lime consuming basic oxygen converter furnaces. Says Robert S. Boynton, general manager of NLA, "Economy of oxygen converters over basic open hearths presages optimistic long-range future for lime in steel, even though the steel industry is 'hurting' at present." He predicted that no more open hearths would be built.

Construction industry outlook for 2nd half

IN "THE OUTLOOK FOR BUSINESS for the Last Six Months of 1960," published by the First National Bank of Chicago, a real estate expert wrote a section on the construction industry. He is James C. Downs, Jr., chairman of the board of Real Estate Research Corp. Here are his estimates:

Residential, off 15 percent.
Commercial, up 5 percent.
Industrial, up 20 percent.
Institutional, unchanged.
Repairs and maintenance will be up 8 percent.
Public construction will be down 8 percent.

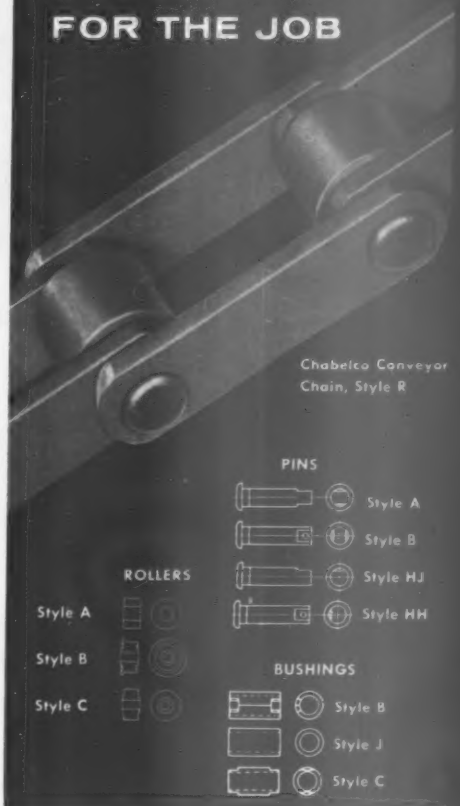
Explores asbestos deposit in northern Quebec

MURRAY MINING CORP. LTD. has announced a major discovery of asbestos in the Northern Ungava region of Quebec, 30 miles south of Deception Bay on Hudson Strait. Approximately 3.5 million tons of high-grade asbestos ore has been indicated by diamond drilling. An additional 3.5 million tons

(Continued on page 63)

Another PLUS value...

COMPONENTS
"TAILOR-MATED"
FOR THE JOB



Need a "special" conveyor chain for a tough service condition such as shock loads or abrasion? In the Rex Chabelco line you'll find just the chain you need—a stock chain with "tailored" strength and wear-resistance for your specific service requirements.

The Chabelco line features a variety of pins, bushings and rollers—each designed for specific service. The right combination assures maximum service life—eliminates risky under-chaining, costly over-chaining.

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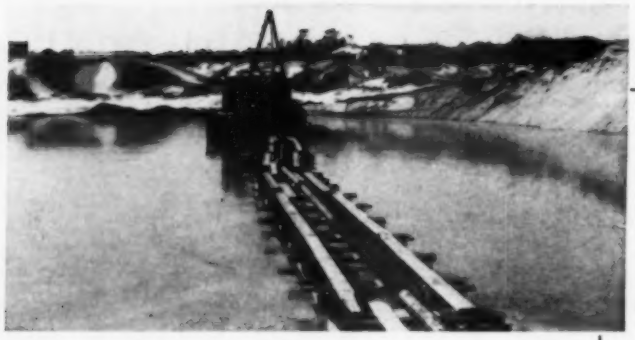
NO REPAIRS YET and NONE EXPECTED SOON



Left: Dredge of Hubbard Sand & Gravel Co., at Bay Shore, Long Island, N. Y.

Hubbard Sand & Gravel Co.
129 Third Ave., Bay Shore, N. Y.
BAY SHORE 7-1808

April 11, 1960

Thomas Foundries, Inc.
Birmingham, Alabama

Gentlemen:

I want to thank you for your interest in our pumping operation. One of your capable engineers visited us the other day and inspected our 8" Thomas Dredge Pump. He did this without our asking for this service.

I was more than pleased to find that after a season and a half operation the wear on this fine piece of equipment was negligible. We now expect to get another season or even two from the original shell and impeller!!

Before arrival of the Thomas Pump, we wondered if we had been wise in our selection. After it arrived there was no longer any doubt - the other pumps look like peanuts in comparison. Also, they require almost constant welding and repair.

I never do anything to my Thomas Pump except run it. Thank you for a fine pump.

Yours truly,

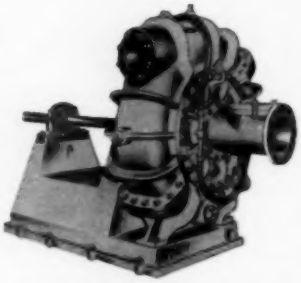
HUBBARD SAND AND GRAVEL CO.

Theodore F. Hubbard

Mr. Hubbard says: "I NEVER DO ANYTHING TO MY THOMAS PUMP EXCEPT RUN IT!"

Left: Theodore F. Hubbard.

Theodore F. Hubbard of Hubbard Sand and Gravel Co., Bay Shore, Long Island, New York, frankly says he first "wondered if he had been wise" in selecting a Thomas pump. Now, after operating his Series HL Thomas DURABLE Dredge Pump, 10" suction, 8" discharge, for a year and a half, he is equally frank to say "there is no longer any doubt—other pumps look like peanuts in comparison"!



Thomas DURABLE Dredge Pump used by Mr. Hubbard.

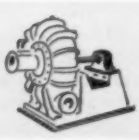
After 18 months service, wear on the impeller and shell liner is negligible. There have been no delays, no shut-downs, no tinkering, no adjusting. What's more—he expects the same good service for another repair-free season, perhaps two seasons!

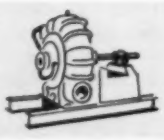
This Thomas pump performance is no accident. The same thing is happening all over the Country, wherever Thomas pumps are used in production of sand and gravel—BECAUSE Thomas pumps are specially designed for high production efficiency and made of Genuine Thomas Ni-Hard Alloy for high resistance to abrasion. "YOU CANNOT BUY AT ANY PRICE A MORE DURABLE PUMP FOR SAND AND GRAVEL—YOU CANNOT BUY ANOTHER PUMP THAT WILL MAKE YOU AS MUCH MONEY."

Thomas Durable Dredge Pumps are manufactured in range of sizes from 6" to 16" discharge. Write or phone for additional information.

THOMAS FOUNDRIES Inc.

P. O. BOX 1111, BIRMINGHAM, ALABAMA





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(Continued from page 61)

is inferred, and more drilling is planned.

Murray Watts, president of the company, said that 9 to 10 million tons would be considered adequate to justify long-term production at a rate of 2,000 tpd. Testing by the Quebec Department of Mines has indicated about 12-percent fiber in the ore; it falls chiefly into groups 4 and 5, plus some short fibers. The quality of the fiber has been pronounced to equal or exceed that of the southern Quebec producing area.

A yearly production of 90,000 to 100,000 tons of fiber is envisaged; most of it would be sold in Europe and other overseas markets. Asbestos magazine reports that the capital cost necessary to bring the property into production will be $35 to $40 million.

Queensland Cement maps expansion

AUSTRALIAN CEMENT PRODUCTION will be boosted by 200,000 tons a year when expansion activities planned by Queensland Cement and Lime Co. are completed. The company, whose present production at Darra is 300,000 tpy., will add a 465-ft. rotary kiln, a coal pulverization plant, 800-tpd. clinker grinding mill and a 250-ft.-high concrete stack. An expenditure of $2.8 million is required.

The operation at Darra, a Brisbane suburb, is unusual in its source of raw material. From reefs around Mud Island, dredges take 600,000 tpy. of coral. Unlike beach deposits comprising quartz sand and varying percentages of shell, the coral around Mud Island is a mixture of calcareous coral and algal material. The company's main carrier, Cementco, has a hopper capacity of 2,000 tons.

The photo shows the Cementco unloading its cargo into the Brisbane River near the Darra plant. Forty-four hydraulically operated doors empty the coral in 30 min. Wharf-mounted cranes recover the material from the river bed. *Photo courtesy Australian News & Information Bureau*

Slag Association safety winners named

TOP AWARDS in the annual National Slag Association safety competition were won by Standard Slag Co.'s Corrigan-McKinney plant, Cleveland, Ohio, and its Republic plant, Youngstown, announces the Bureau of Mines. The former had the best record in Group A—plants working 60,000 man-hours or more; the latter, in Group B —plants working less than 60,000 man-hours. Each worked throughout the competitive year without a disabling work injury. Actual man-hours posted were: Corrigan-McKinney, 81,-695, and Republic, 57,970.

Twenty-three other plants in Group B operated during the competition year without a disabling work injury. The Republic plant attained top honors because it recorded the highest number of man-hours worked.

Certificates of Achievement in Safety were given to the following plants, each of which worked 20,000 or more man-hours during the period:

South Deering plant, Illinois Slag & Ballast Co., Chicago, Ill.; 54,403 man-hours.

Pittsburgh plant, Duquesne Slag Products Co., Pittsburgh, Pa.; 51,799 man-hours.

Harriet No. 3 plant, The Buffalo Slag Co., Inc., Tonawanda, N.Y.; 42,-965 man-hours.

East Toledo Slag plant, The France Stone Co., Toledo; 42,946 man-hours.

Bethlehem Slag plant, Bethlehem Steel Co., Bethlehem, Pa.; 42,519 man-hours.

Birmingham plant, U.S. Pipe and Foundry Co., Birmingham, Ala.; 41,-640 man-hours.

Portsmouth plant, The Standard Slag Co., New Boston, Ohio; 34,672 man-hours.

Aliquippa plant, Duquesne Slag Products Co., West Aliquippa, Pa.; 33,555 man-hours.

Donora plant, Cambria Slag Co., Donora, Pa.; 32,267 man-hours.

Sharpsville plant, Cambria Slag Co., Sharpsville, Pa.; 27,334 man-hours.

Midland plant, The Midland Slag Co., Midland, Pa.; 25,520 man-hours.

Ashland plant, The Standard Slag Co., Ashland, Ky.; 25,141 man-hours.

Sheridan plant, Sheridan Slag Co., Sheridan, Pa.; 24,940 man-hours.

(Continued on page 64)

Another PLUS value..

PREMIUM CHAIN
...NO EXTRA COST

Rex Roller Chains are designed to give you longest possible wear life. For example, as shown above, all standard roller chains have oil holes in the bushings to assure easy penetration of life-adding lubricant to the important pin-bushing contact area...a vital factor, particularly on high-speed drives. You get many more cycles of wear life...a PLUS VALUE premium chain at no extra cost. For complete information, mail the coupon.

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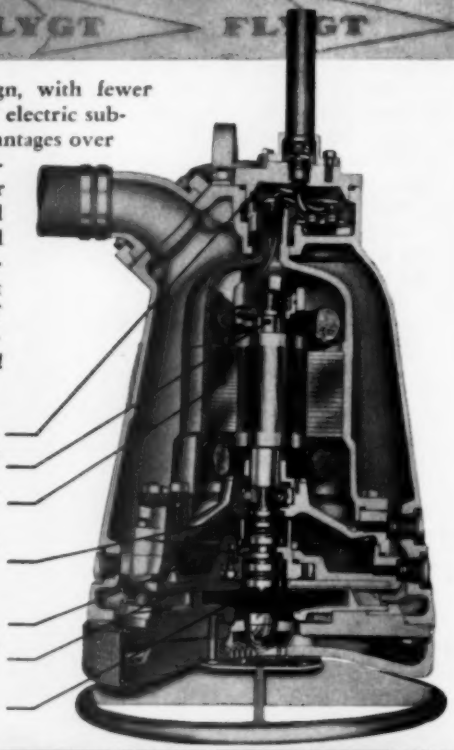
THE INSIDE STORY OF FLYGT SUCCESS

Simple, revolutionary design, with fewer parts involved, gives FLYGT electric submersible pumps definite advantages over ordinary pumps. This internal simplicity produces higher pumping capacity at costs well below conventional units. All cast parts are a special aluminum alloy; impellers to suit each application. Let FLYGT prove itself — ask for an on-the-job demonstration today!



1. Junction box
2. Shaft, journalled in SKF bearings
3. Electric motor, watertight enclosure, running in air
4. FLYGT mechanical seals for heavy-duty
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7. Impeller of special alloy

1½" B-38L running dry on construction job

3" B-80L under water level on river job

6"-8" B-150/200L on power house dam project

FLYGT Corporation HOOSICK FALLS, N. Y.

Visit FLYGT at the AMC Mining Show Booth 1016

WESTERN SALES & SERVICE: STANCO MFG'S. & SALES INC., 1666 Ninth St. (CORNER OF OLYMPIC) SANTA MONICA CALIF.

PUMP BETTER ELECTRICALLY — USE FLYGT!

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(Continued from page 63)

Erie No. 5 plant, The Buffalo Slag Co., Inc., Erie, Pa.; 23,870 man-hours.

Lordstown plant, The Standard Slag Co., Lordstown, Ohio; 22,691 man-hours.

Cement plants add trucking facilities

THE EASTON, PA., EXPRESS carried a rundown of cement plants in Northampton County that have begun shipping by truck. There has been marked activity in their addition of new storage and truck-shipment facilities. Listed in the rundown:

- Alpha Portland Cement Co.'s Martins Creek plant. A separate bulk truck-loading station has been built there.
- National Portland Cement Co.'s Brodhead plant. Shipping by truck since mid-March, the plant has installed new storage silos for direct bulk loading into trucks or railroad hopper cars.
- Lehigh Portland Cement Co.'s Sandts Eddy plant. Bins have been built and a truck scale and special road system have been provided.
- Lehigh Portland Cement Co.'s Fogelsville plant. Truck shipments were begun there in January.
- Nazareth Cement Co. Alterations have been made to existing equipment and plans are under way for permanent trucking facilities and additional storage capacity.
- Hercules Cement Co.'s Stockertown plant. A new 4,000-bbl. bin has been erected for truck loading.
- Keystone Portland Cement Co.'s Bath plant. New silos add considerably to storage space and expedite both truck and rail shipments.

Sand and gravel dredging company is organized

UNITED SAND AND GRAVEL CO., Marin County, Calif., has been formed by A. G. Schoonmaker Co. and Associated Dredging Co. Capitalized at $500,000, it will be a high-production venture using a giant dredge to extract sand from the bottom of the bay. The first of a series of vessels having 1,300-cu. yd. hoppers for the operation is under construction.

Officers of the corporation are: T. Schoonmaker, R. E. Rich and E. B. Pike.

(Continued on page 67)

When you need IT in a hurry...

...a phone call to your Rex Distributor solves your problem. If he hasn't got IT in stock (incredible), he can get IT within 24 hours from the nearby Rex CHAIN Belt warehouse. Protect your temper ...your fingernails...your production schedules...by turning your problems over to your dependable Rex Distributor.

IT (freely translated) means Rex Quality Drive and Conveyor Chains, Sprockets, Flexible Couplings, Belt Idlers, Pulleys...Shafer Roller Bearings. CHAIN Belt Company, 4649 W. Greenfield Ave., Milwaukee 1, Wisconsin. In Canada: CHAIN Belt (Canada) Ltd., 1181 Sheppard Ave., East, Toronto.

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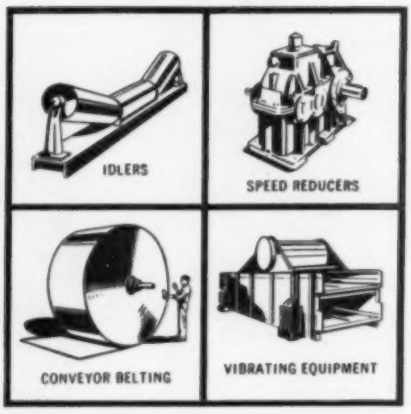
How's this for troughing?



These unretouched photos, taken at the Arizona Sand & Rock Company plant in Phoenix, show what quality Hewitt-Robins belt conveyor idler construction means. The precision troughing will result in longer belt life, higher delivered tonnages, and reduced maintenance during the entire life of the conveyors. Throughout the aggregates industry, operators benefit from Hewitt-Robins . . .

- **Conveyors**—sectional (from stock).
- **Belts**—in a wide variety of constructions.
- **Idlers**—standard, heavy duty, cushion, and flexible rubber spiral types.
- **Vibrating Equipment**—only H-R manufactures all four types of screens; a complete line of feeders, foundry and car shakeouts.
- **Screen Cloth**—in many meshes, designs, and materials.
- **Speed Reducers**—one of the most comprehensive lines in industry.

The quality and dependability you'll find in Hewitt-Robins conveyor idlers are built into all H-R bulk materials handling equipment. For full details consult your H-R representative, or write Hewitt-Robins, Stamford, Connecticut. Ask for Bulletin 9-19.

HEWITT-ROBINS

THE NAME THAT MEANS EVERYTHING IN BULK MATERIALS HANDLING SYSTEMS . . .

CONVEYOR BELTING AND IDLERS • INDUSTRIAL HOSE • VIBRATING FEEDERS, SCREENS & SHAKEOUTS • POWER TRANSMISSION EQUIPMENT

Enter 1235 on Reader Card

(Continued from page 64)

Blair Limestone Div. installs gas-fired kilns

TWO NEW GAS-FIRED KILNS at the Blair Limestone Division of Jones & Laughlin Steel Corp. plant, Martinsburg, W. Va., will double capacity and improve the quality of burned lime. The kilns have a yearly rated capacity of 72,000 net tons, and are replacing 11 coke-fired kilns that have been in operation since 1911.

Latest equipment for air pollution abatement has been incorporated into the kiln design with automatic door controls. Gas is shut off when a door is opened for charging, thereby preventing emission of gas. Also, the gas-fired kiln results in a decrease in the amount of sulfur in the burned lime—75 to 80 percent less, according to George E. Alter, Jr., division manager.

The new kilns are oblong-shaped, 12 ft. wide, 14 ft. long and 52 ft. high. Average inside diameter is 9 ft. Features include automatic charging of materials, continuous discharge of finished product, conveyor lines for materials handling, automatic controls for movement of product within the kilns and automatic heating.

Prince Edward Island gets silica sand plant

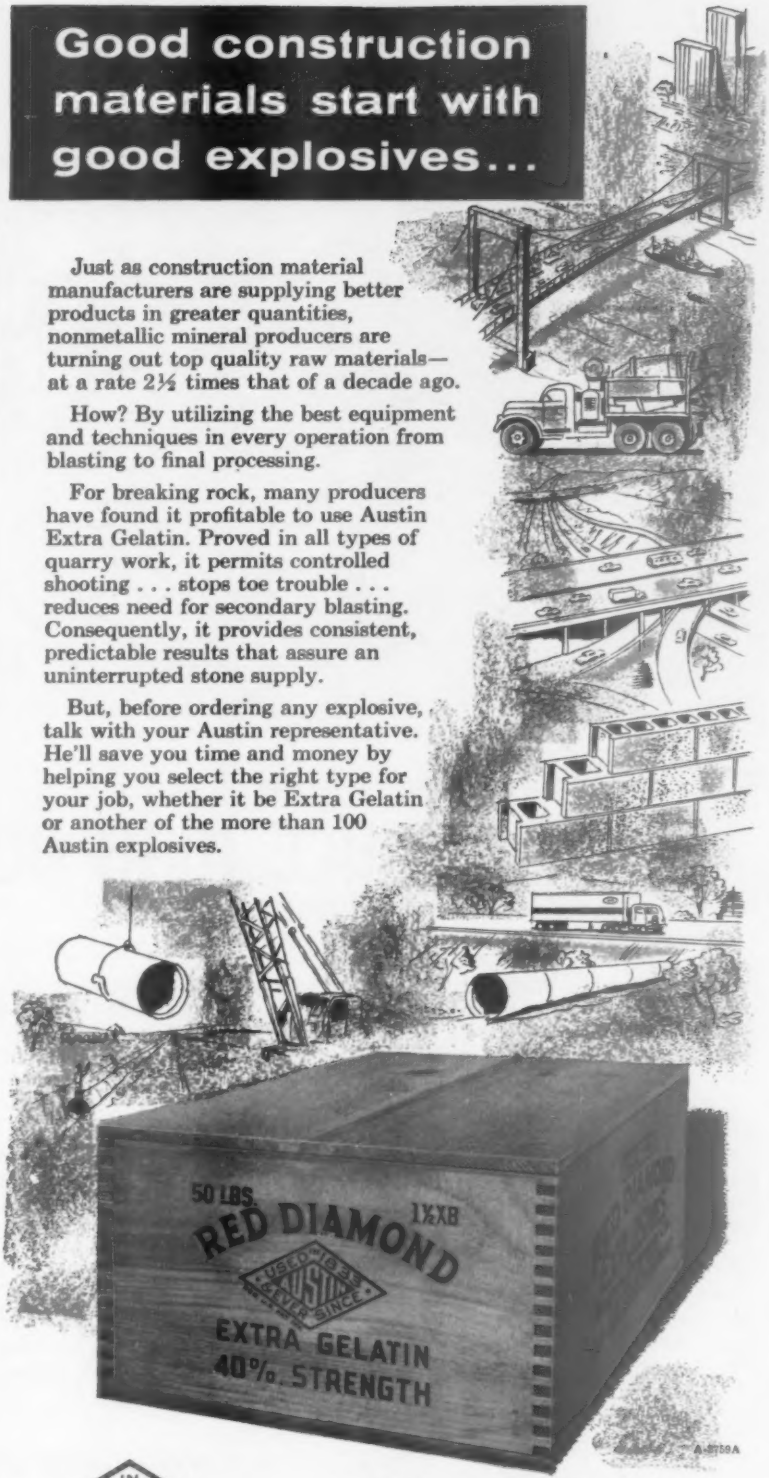
DISCOVERY OF SILICA SAND at Bothwell, Prince Edward Island, led to announcement of two new plants. One, at Elmira, will process the sand for the electronics industry. The other, at Charlottetown, will open this month to manufacture brick. The brick will be a new type developed with the help of the National Research Council. Both plants will be operated by Silica Sand Co., Montreal.

ASTM committee accepts new cement specification

COMMITTEE C-1 ON CEMENT of American Society for Testing Materials has accepted a proposed specification for additions used in processing portland cement. The action was taken at ASTM's annual meeting in Atlantic City. The new specification will relieve the committee of the responsibility of approving additions and will place this responsibility in the hands of the manufacturer who would be guided by the

(Continued on page 70)

Good construction materials start with good explosives...



Just as construction material manufacturers are supplying better products in greater quantities, nonmetallic mineral producers are turning out top quality raw materials—at a rate 2½ times that of a decade ago.

How? By utilizing the best equipment and techniques in every operation from blasting to final processing.

For breaking rock, many producers have found it profitable to use Austin Extra Gelatin. Proved in all types of quarry work, it permits controlled shooting . . . stops toe trouble . . . reduces need for secondary blasting. Consequently, it provides consistent, predictable results that assure an uninterrupted stone supply.

But, before ordering any explosive, talk with your Austin representative. He'll save you time and money by helping you select the right type for your job, whether it be Extra Gelatin or another of the more than 100 Austin explosives.

USED IN 1833 AUSTIN & EVER SINCE

AUSTIN
POWDER COMPANY
CLEVELAND 13, OHIO

explosives ◆ ammonium nitrates ◆ primers ◆ detonating fuse
permissibles ◆ blasting supplies ◆ AP drill heads and bits ◆ mine tools

Enter 1300 on Reader Card

Portable Lima Austin-Western 101-SE crushing plant spews pit-run stone and gravel into mobile surge bin.

Lima A-W Portable Crushers deliver

RELIABLE HIGH OUTPUT!

Designed and built for high output under *rugged* operating conditions, this portable Lima Austin-Western crushing plant is *ready* to pick up and go on a moment's notice. It belongs to the Williams Brothers Asphalt Paving Company, Ionia, Mich.

Reduced tonnage costs

They say, "It's a reliable high-output mobile rig that's been doing a very dependable job for us in widely separated locations throughout southern Michigan.

"It's not a complicated piece of equipment. Only minimum maintenance has been required. It's easy to adjust to meet a wide range of rigid specifications in pit or quarry work. We find that the outfit's one man, central control also helps us to reduce costs per ton."

The 101-SE is a completely portable, self-contained unit designed and built for rapid transport from job to job. High-speed production of construction materials near the job greatly reduces hauling time and costs.

Maintenance reduced

Diesel power operates crushers and electric generator; all other operations are electric. Simplicity of transmission eliminates troublesome clutches, chains, sprockets and gearboxes . . . reduces maintenance, increases tonnage profits.

There's a portable or stationary Lima Austin-Western crushing and screening plant just right for your needs. Investigate—see your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Stationary installation—Lima A-W line includes jaw and roll crushers, matching screens, elevators, conveyors and bins.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA AUSTIN-WESTERN Crushing, Screening and Washing Equipment

BALDWIN · LIMA · HAMILTON

CONSTRUCTION EQUIPMENT DIVISION • LIMA, OHIO

6015

Enter 1236 on Reader Card

Enter 1237 on Reader Card

3½-yd. Lima 1250 shovel loads blasted rock in Canadian quarry.

Air-controlled Lima 1250 speeds rock loading

If you want to move more rock faster, easier and more profitably—Lima's the shovel for you!

Take the Lima 1250 as an example. Its main and auxiliary functions are air-controlled for smooth precision performance at full capacity operation. Torque converter, with either Diesel or electric power, reduces shock loading . . . makes heavy digging and rock handling easy on both machine and operator. The type 1250 can be knocked down for over-the-road transfer from job to job.

All Limas can be depended upon to boost profits, because they are top-quality machines designed and built to outperform other makes.

This also results in consistently high production with a minimum of downtime and years of trouble-free, low maintenance service.

There's a Lima type and size for every pit and quarry operation. Shovels to 8 cu. yds., draglines variable. Limas easily convert to cranes—up to 140 tons on crawlers. Choice of power; crawler, wagon or truck mounted.

It won't cost a cent to investigate Limas before you buy your next shovel or dragline—and it might pay off handsomely in increased profits and reduced maintenance costs. Talk to Lima owners. Ask for facts and figures from your nearby Lima distributor or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON

6044

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

BALDWIN BLH LIMA-HAMILTON

Drill Blast Holes 2 to 5 Times Faster...

The BLASTHOLER, a self-propelled rotary drill, is mounted on tracks or dual pneumatic tires. It covers the ground like a bulldozer. Only one operator is required, and the BLASTHOLER carries its own air for cleaning blast hole. In limestone quarries meeting highway specifications, the BLASTHOLER can drill 20′ holes in an average of 3 to 4 minutes. Many BLASTHOLERS have drilled more than a million feet within a 2-year period. The BLASTHOLER can improve your production record and save you money, too. Contact your nearest dealer for a cost-cutting demonstration today!

• ONE OPERATOR

• ONE MACHINE

BLASTHOLER drilling 25′ blast holes 3″ in diameter in limestone quarry. Production averages 1200′ per day.

BLASTHOLER DEALERS

The W. W. Williams Co.
Columbus, Ohio

Reid-Holcomb Co., Inc.
Indianapolis, Ind.

Watson Equipment Co., Inc.
Pittsburgh, Pa.

Ray C. Call Co., Inc.
South Charleston, W. Va.

Illinois Road Equipment Co.
Springfield, Illinois

Williams Tractor Co.
Louisville, Ky.

Hi-Way Machinery Co.
Dallas, Texas

Bublitz Machinery Co.
North Kansas City, Mo.

James W. Bell Co., Inc.
Cedar Rapids, Iowa

Anderson Equipment Co., Inc.
Omaha, Neb.

Wylie-Stewart Co., Inc.
Oklahoma City, Okla.

Contractors Machinery Co.
San Antonio, Texas

Wisconsin Drilling & Equipment Co., Inc.
Madison, Wis.

DRILLING ACCESSORY AND MANUFACTURING COMPANY, INC.

2006 South Industrial Boulevard Dallas, Texas

Enter 1287 on Reader Card

(Continued from page 67)

specification. The action is subject to ratification by letter ballot of the committee and approval by the ASTM Administrative Committee on Standards sometime this fall.

Other developments at ASTM: New methods of tests were approved for determining the amount of water-soluble alkali in masonry cements, as well as for evaluating false set and potential sulfate resistance of portland cement.

The chemical requirements for portland cement in portland-blast furnace slag cement will contain several changes as recommended to the committee. An increase in the autoclave specimens limited for portland cement also is under consideration.

A cooperative series of tests to determine the influence of time of wait during mixing of mortars in the testing of masonry cement has been completed with results obtained from 21 laboratories. This test program is part of a joint study by both Committee C-1 on Cement and C-12 on Masonry Mortars.

Dr. A. Allan Bates was named chairman of a new joint subcommittee on Cement and Concrete Reference Laboratory. It will have equal representation from both Committees C-1 on Cement and C-9 on Concrete and Concrete Aggregates.

Glass bag filters at Southwestern plant

SOUTHWESTERN PORTLAND CEMENT Co. is installing a glass-bag dust filtration system on one of four kilns at El Paso, Texas. Work started during July and was to be completed in three or four months. Cost of the installation, said Herman Liebreich, the cement company's Southwest Div. manager, would be $100,000.

Mik-Ron purchases asbestos claim

A 500-ACRE ASBESTOS DEPOSIT northeast of Coalinga, Calif., has been sold to Mik-Ron, Inc., by four California men. The claim has been estimated to contain more than 50 million tons of asbestos. Mik-Ron has leased the property to Basic Resources Corp. of Salt Lake City, Utah. Headed by Philip S. Hoyt, the Salt Lake City firm is building a pilot mill at the edge of Coalinga.

END

Johnny Unitas demonstrates newest H&W high-strength packaging paper . . .

EXPANDA-KRAFT

THE GREAT NEW NAME IN EXTENSIBLE KRAFT

THIS AD IS PRINTED ON EXPANDA-KRAFT WHITE
You can also buy Expanda-Kraft
in Semi-Bleached or Natural. Imagine how attractive *your product*
would look, packaged in Expanda-Kraft.
To learn how well your product can be *protected* by Expanda-Kraft, see other side . . .

EXPANDA-KRAFT

DEFIES SHOCK!

The bullet passes of Johnny Unitas have the terrific impact to rip through regular kraft (above), yet, thrown at the same speed, they bounce off Expanda-Kraft because of its greater resiliency (left). Johnny Unitas, all-pro quarterback of the Baltimore Colts, demonstrated the toughness of Expanda-Kraft at the National Packaging Show in Atlantic City. Each target consisted of four plies of 50-lb. basis weight stock. Time after time, in standard drop tests, bags made of Expanda-Kraft have proved their superior strength.

EXPANDA-KRAFT REDUCES BREAKAGE It has *two-way stretch*, soaks up shocks that would break ordinary kraft of equal basis weight.

EXPANDA-KRAFT WITHSTANDS MOISTURE *High humidity* and *weathering* have little effect on Expanda-Kraft! It retains its full toughness and firmness.

EXPANDA-KRAFT PRINTS SHARP This advertisement is printed on 50-lb. Expanda-Kraft White from a regular production run. Other shades print as well to enhance sales appeal.

EXPANDA-KRAFT BAGS STACK SECURELY They have a coefficient of friction higher than regular kraft bags, stack with less risk of slippage, stay in place while in transit.

EXPANDA-KRAFT BAGS FILL FAST They meet required porosity standards, yet are rigid enough to stand up to high speeds on the filling line.

Expanda-Kraft is the winner in impact test against regular kraft. Bags of each type were filled with sand, suspended on long ropes, sent hurtling toward each other. Regular kraft bag, photographed at high-speed as it burst, had same ply construction as Expanda-Kraft bag.

CONTACT YOUR MULTIWALL BAG SUPPLIER for information on the use of Expanda-Kraft where rigidity, resilience, strength, moisture resistance and uniformity are required. Expanda-Kraft is made by a new roll-crepe process and is available to multiwall bag manufacturers in 40, 50, 60, 70 and 80-lb. basis weights; White, Semi-bleached or Natural. *Hollingsworth & Whitney, Division of Scott Paper Company, Dept. G, Chester, Pa.*

HOLLINGSWORTH & WHITNEY DIVISION OF
SCOTT PAPER COMPANY

CALENDAR

OF COMING EVENTS

1960

Sept. 28-Oct. 1, 1960—National Lime Association, Annual Operating Meeting, Conrad Hilton Hotel, Chicago

October 3-6, 1960—National Sand & Gravel Association, Semi-Annual Meeting, Board of Directors, Del Monte Lodge, Pebble Beach, Calif.

October 10-13, 1960—American Mining Congress, 1960 Metal Mining and Industrial Minerals Convention and Exposition, Las Vegas, Nev.

October 13-15, 1960—Empire State Sand, Gravel & Ready Mix Association, Fall Conference, Hotel Syracuse Country House, Syracuse, N.Y.

October 17-19, 1960—Biannual Symposium on Drilling and Blasting, Colorado School of Mines, Golden, Colo.

October 18-19, 1960—Cement, Quarry & Mineral Aggregates Section, National Safety Congress, Conrad Hilton Hotel, Chicago, Ill.

November 3-4, 1960—National Slag Association, Annual Meeting, Hotel Mayflower, Washington, D.C.

1961

January 17-19, 1961—National Limestone Institute Inc., 16th Annual Convention, Statler-Hilton Hotel, Washington, D.C.

January 17-20, 1961—National Crushed Stone Association, Annual Convention, Hotel Americana, Bal Harbour, Fla.

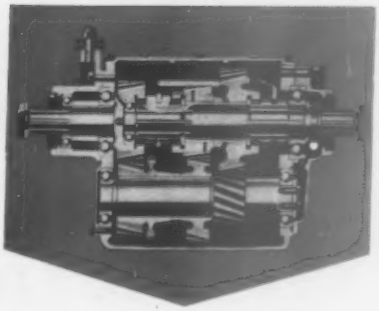
January 23-26, 1961—National Sand & Gravel Association, Annual Convention, Hotel Americana, Bal Harbour, Fla.

Jan. 29-Feb. 3, 1961—American Society for Testing Materials, Committee Week, Netherland Hilton Hotel, Cincinnati, Ohio

March 5-8, 1961—American Road Builders Association, 59th Annual Convention, Atlantic City, N.J.

April 12-14, 1961—American Institute of Mining, Metallurgical & Petroleum Engineers, International Symposium on Agglomeration, Sheraton Hotel, Philadelphia, Pa.

April 18-20, 1961—American Institute of Electrical Engineers, Cement Industry Technical Conference, The Sheraton-Cadillac, Detroit, Mich.



Specify
FULLER
Specify the
MODEL

For heavy duty trucks and tractors specify the
FULLER '92 SERIES
3-SPEED AUXILIARY

- **High capacity**
- **Widest range of ratios**
- **Top-mounted power take-off optional**
- **Low initial cost, reduced maintenance**
- **Available from all truck manufacturers on specification**

92 SERIES (Heavy-Duty) RATIOS

	SPLITTER RATIOS		DEEP REDUCTION
MODEL	High	Intermediate	Low
3-A-92	.74	1.00	2.09
3-B-92	.84	1.00	1.24
3-C-92	.75	1.00	2.64
3-D-92	.75	1.00	1.24
3-E-92	.84	1.00	2.09
3-F-92	.84	1.00	2.64
3-G-92	1.00	1.327	2.09
3-H-92	1.00	1.327	2.64

FULLER MANUFACTURING COMPANY
(Transmission Division)
KALAMAZOO, MICHIGAN
Subsidiary EATON Manufacturing Company

Enter 1226 on Reader Card

"Load-out time in sand is 100 seconds for 21-ton load"

PAYLOADER®

model H-120 tractor-shovels serve at two plants of Maule Industries, Inc.

Maule Industries, Inc. operate four large sand and gravel plants, plus concrete-block, ready-mix, prestressed and other concrete product plants that serve Southern Florida as far north as Ft. Pierce.

Model H-120 "PAYLOADER" units are used at two big crushing plants — at Miami and Ft. Lauderdale. They load truck and rail cars with the 20 different blends of specification rock and sand. Illustrations show the H-120 in typical action at the Red Road, Miami operation where the plant manager, R. H. Taylor, reports on its performance.

Big capacity, long reach

"We needed a versatile machine for large-truck and rail car loading from scattered stockpiles, and the Hough H-120 was the answer to our needs," says Mr. Taylor. "This machine gives us a 15-foot reach with ease."

Power and speed

"It never uses full power and fills its bucket with minimum effort so that loading speeds are very good. Load-out time for a 21-22-Ton truck load is 100 to 110 seconds, with 4 to 4½ yds. per bucket load. An average 8-hr. day includes the loading of 2200 to 2500 tons, plus traveling 25-30 miles between stockpiles."

Replaces crane and tractor-shovel

"Our H-120 replaced a 1¾ yd. crane and a smaller tractor-shovel, and during its 600 hours of operation has experienced only normal service time inspections and maintenance."

A size for every need

Whether you need the big capacity of the Model H-120 or a smaller "PAYLOADER" there are nine models from which to choose, including five 4-wheel-drive sizes — and each model outstanding in its class. Your Hough Distributor is ready to help you select the one that fits your needs.

Power, traction, tip-back bucket action and bucket design combine to dig full bucket loads in a hurry.

Full tip-back at low level retains heaped loads — gives stability and visibility for fast, safe carry.

Enter 1238 on Reader Card

Your "PAYLOADER" Distributor is ready to serve you with one of the most complete parts and service setups in the tractor-shovel business, backed by factory service personnel. Contact him today, write, or return the coupon.

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER and PAY are registered trademark names of The Frank G. Hough Co., Libertyville, Ill.

THE FRANK G. HOUGH CO.
705 Sunnyside Avenue, Libertyville, Illinois

☐ **Send data on the Model H-120**
☐ **Send data on smaller "PAYLOADER" models**

Name _____

Title _____

Company _____

Street _____

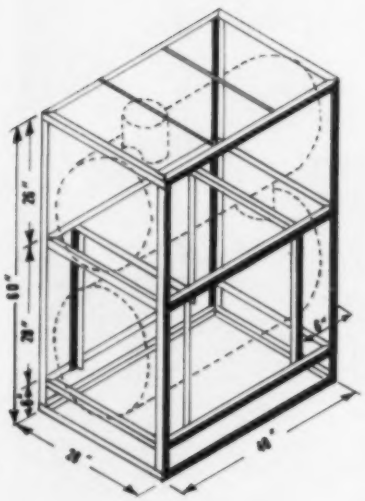
City _____ State _____

9-8-4

Enter 1239 on Reader Card

HINTS & HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN



Drums make shop stove

THE SALVAGED OIL DRUM is a versatile piece of scrap that rock products producers have drafted for many jobs. One of the rainy-day jobs our shop crew whipped up is the two-drum stove that keeps things comfortable in the shop all winter long. With natural gas available as fuel, it was no chore to extend the line to the new hot-air stove.

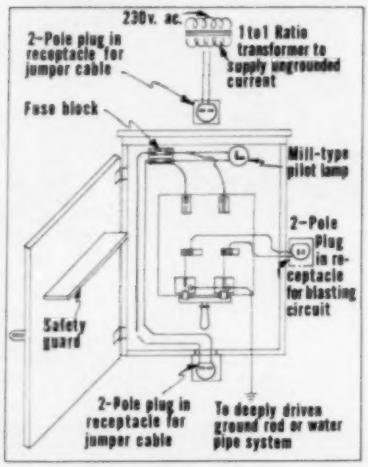
The forward end of the lower drum is cut with a torch to take a combination fire-door and damper-ash-door combination purchased from a local heavy hardware store. Fire brick was laid across the floor of the drum to serve as insulation. The segmental section about the cast iron door ensemble was reinforced with ¼-in. plate to stiffen this vulnerable cut-out section of the shop-made furnace. Because of the hot gas volume, an 8-in. standard pipe nipple was welded in the back section of the fire box and the lower back section of the radiator drum. A 6-in. nipple was, in turn, welded to the top rear of the radiator.

The two drums are hung in a frame made of 1¼x1¼x¼-in. black iron angles. One drum was set so that the cast iron door frame assembly projected just beyond the 30-ga. sheet iron casing. This was lapped over for 2 in. at the joints, bent at 90 deg. and fastened with self tapping screws run in drilled holes.

Not shown in the sketch are two screened openings each 20 in. sq., for the cold air intake. Two openings of the same size with 45-deg. elbows were placed on the upper section of the casing.

Williams Ammons, Oak Ridge, Tenn.

Blasting switch with built-in safety


230v. ac.
1 to 1 Ratio transformer to supply ungrounded current
2-Pole plug in receptacle for jumper cable
Fuse block
Mill-type pilot lamp
2-Pole Plug in receptacle for blasting circuit
Safety guard
2-Pole plug in receptacle for jumper cable
To deeply driven ground rod or water pipe system

ELECTRICAL DETONATION has many advantages over other methods. It gives instantaneous action for the entire network of shot pattern. Its adaptability to many types of circuits with timed delay detonators makes for vastly improved control over the blasting operations.

There are still several fundamental, basic safety considerations to observe. Makeshift power sources such as connection to spark plugs, cells and others even less reliable lead to trouble with a capital T. The same holds true even for many control switches, blasting machines and lead wires. There certainly is no economy in compromising with safety in blasting work. But it is still possible with a limited outlay and ingenuity to produce a safe dependable blasting system that will serve the operator well.

The principal item in our system is a 60-amp., double-pole, double-throw switch mounted on a dielectric base of slate, marble or transite. The switch is mounted in the back of a wood cabinet with sloping roof fashioned of 1 in. clear stock. Space is allowed in the upper section to permit mounting a porcelain fuse block and lamp base.

A baffle or guard is screwed in place inside the upper section of the door. This adds a valuable safety feature to prevent closing the door before the blades are thrown. In the Down position both blades are short circuited and grounded simultaneously. With the firing line plugged into the right hand receptacle, this safety position means that the line is completely safe from any so-called "sneak" currents that are induced by adjacent power lines, rails, pipe lines or buried cable runs, or the insidious hazard of lighting in its early stages.

Since the firing line is grounded through a low resistance connection to earth by rods or water pipe, it can be used effectively as a reference to check the dielectric value of the maze of blast wires. Whenever the needle of the galvanometer is deflected more when reading leakage to ground than when read across the connected shots, it is possible that some part of the shot is likely to misfire.

The heavy-duty hasp and staple is bolted in place with nuts peened over to prevent tampering by unauthorized persons. As a further safeguard, no energy is present in the box until a short jumper cable is used to bridge from the upper, 230-v. ac. current supply to the lower box receptacle. Two male plugs of odd make are used to prevent substitution. Cartridge-type fuses are used with filler strips to match the average shot requirements. The mill-type pilot lamp leaves no doubt about the availability of power.

Paul C. Ziemke, Clinton, Tenn.

END

Enter 1258 on Reader Card

saves $1500 PER MONTH with orton crane and dropball

Study reveals 19.96% savings over conventional plugger and explosive method

In a series of exhaustive tests in an open pit operation, a large mining corporation has recently determined that the cost of breaking rock can be cut by over $18,000 per year with the use of an ORTON Crane operating a dropball.

The tests considered all expenditures including cost of equipment, labor and maintenance.

Intangibles such as reduced air consumption, plugger replacements, decreased shovel maintenance, less time loss at the crusher were *not* included in the tests. These factors are considered worth many more thousands of dollars.

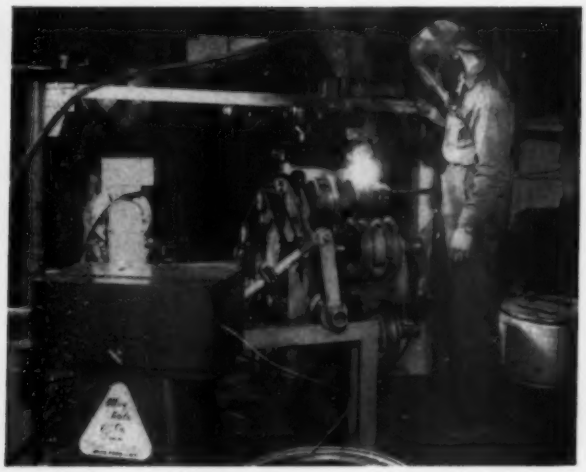
ONE IMPORTANT POINT WAS OBVIOUS IN THE REPORT: *The ability of a compact, mobile crane to stand up under this shattering work, continuously, shift after shift with little or no maintenance or down time is a highly significant factor in these savings!*

For facts about this remarkable crane—or other units up to 250-ton capacity, write for brochure.

Note easy accessibility to diesel engine. ALL ORTON cranes have smooth, shock-free, Torque-Control fluid clutch, finger-tip, air-operated controls, anti-friction bearings throughout—and are also available in *completely hydraulic* models.

orton

CRANE AND SHOVEL CO.
608 S. Dearborn Street CHICAGO 5, ILLINOIS
THE MOST POWERFUL NAME IN CRANES



Enterprising Raymond Steele, always alert to new time saving methods, constructed this six spindle roller rebuilder utilizing the Wear-O-Matic open arc hard surfacing process, greatly increasing the efficiency of his operation. Geared to the constant feed of Wear-O-Matic alloys from 100 pound Weld-Paks, this machine turns out roller after roller rebuilt and hard surfaced with long wearing deposits.

Equipment too large or cumbersome to be moved to the shop for rebuilding can be hard surfaced semi-automatically at the job site. The versatile Wear-O-Matic Wire Feed Unit and Weld-Pak is easily transported for field application of Wear-O-Matic wires.

By attaching the Wear-O-Matic welding nozzle to an automatic travel device, New Enterprise rebuilds crusher hammers automatically at a tremendous savings over manual applications. In addition, the weld deposit is smoother and more uniform.

New Enterprise Stone & Lime Co., Roaring Springs, Pennsylvania, operates seven plant locations in west-central Pennsylvania. This diversified, complex organization produces ready-mix concrete, pulverized rock, agricultural lime, black-top road material and pre-stressed concrete structures in addition to road and sewer construction projects and turnpike maintenance. Trucks, shovels, dozers, loaders and other movable equipment are maintained at the central maintenance shop in Roaring Springs under the guidance of Raymond Steele, Maintenance Supervisor.

Production Soars—Costs Go Down for Maintenance Shop Handling Seven Quarries

WEAR-O-MATIC PROCESS PROVIDES THE ECONOMY AND VERSATILITY NECESSARY FOR A VARIETY OF EQUIPMENT

Maintaining the equipment necessary for operating seven plant locations keeps even the well equipped, efficient shop of New Enterprise Stone & Lime Co. hustling for time saving, cost saving methods. The production per man hour possibilities of the Wear-O-Matic hard surfacing process led Mr. Raymond Steele, Maintenance Supervisor, to purchase one of the first Alloy Rods Company Wear-O-Matic Wire Feed Units. The results were so outstanding in time saving, diversified uses and superior, long-wearing deposits from Wear-O-Matic wires that New Enterprise now employs four Wear-O-Matic units in its program.

Says Mr. Steele . . . "With the Wear-O-Matic process, we put down 3 to 5 times more weld metal per hour than with stick electrodes. With no waste from left over stub ends, the semi-automatic wire costs us less per pound. Another item that saves valuable time . . . once you strike the arc with Wear-O-Matic, you don't stop until the job is finished. You get 100 pounds of continuous electrode in each Weld-Pak, ideal for our automatic set-ups. The deposits we get with Wear-O-Matic wires really hold up. We've had better results than with any other wire we've ever tried, and we have tried most of them."

Productive capacity, operating costs, deposit quality, shop versatility are important factors for efficient maintenance operations. The Wear-O-Matic hard surfacing process provides these advantages and at a cost within the range of any shop regardless of size. Find out now how the Wear-O-Matic process can increase the capacity of your maintenance shop.

Call your Alloy Rods Company distributor or representative for a Wear-O-Matic demonstration in your own shop. Or write to Alloy Rods Company, P. O. Box 1828, York 34, Pa., for more information.

ALLOY RODS COMPANY

YORK, PENNSYLVANIA

SALES OFFICES & WAREHOUSES; BOSTON, NEWARK, PHILADELPHIA, PITTSBURGH, BIRMINGHAM, CHICAGO, SAN FRANCISCO & EL SEGUNDO, CALIF.—DISTRIBUTORS IN ALL OTHER PRINCIPAL CITIES

TWENTY YEARS OF LEADERSHIP IN THE DEVELOPMENT OF QUALITY ALLOY ARC WELDING ELECTRODES

Enter 1271 on Reader Card

4½ yds, 262 hp provide new approach to basic quarry production problems

One machine replaces

The scene is Mississippi Lime Company's stone plant and quarry near Alton, Illinois. The machine is a Michigan Model 275A Tractor Shovel, with 22,000 lb lift capacity, 4½ yd bucket, 262 hp. Working both above *and* below ground, *it alone is doing the work of two swing shovels and two dozers.* The company's superintendent of operations explains some of the Michigan's assignments . . .

Charges pug mill: 4,000 tons per day

Originally the pug mill was charged by two swing shovels and two crawler dozers (228 hp on tracks and 218 hp on rubber). Pushing stone out of stockpile to the swing shovels was slow, inefficient, took two to three hours overtime to achieve 4,000 ton per day production. A test was arranged in the hope that the Michigan's speed and 4½ yd bucket capacity could take over.

It did—and how!

The 262 hp Michigan Tractor Shovel today does the whole job alone in 8 hours, *without overtime.* Dozing is no longer necessary; the Michigan, with its 12′ 11″ clearance under bucket hinge, feeds direct into elevated hoppers.

Does work of two swing shovels truckloading stockpiled stone

Other times, the Michigan handles truck-loading of stockpiled stone. Typical 18 yd semis are heaped in 4 passes, 2 minutes. Time is less than one-third that required by either of the two 1½ yd electric swing shovels formerly used for this operation.

About the only job left for the swing shovels, in fact, is loading out shot rock in the quarry. And the Tractor Shovel *can* handle this task. When it does, the costly operation of dozer cleanup is eliminated too.

Piling shot rock for loading, Michigan lifts and pushes material higher than could dozers previously used.

Typical load for Mississippi Lime's Michigan: 4½ yds of 2700 lb material. Note the two 1½ yd shovels, sidelined since the big Michigan took over this pug mill feeding job.

High dumping clearance, 12' 11", makes pug mill charging an easy job. Michigan feeds 4,000 tons of crushed limestone every 8 hours, has time to spare for other production jobs.

the four "normally" needed

Piles, cleans shot rock in underground quarry

By speeding these regular production jobs, Supt. E. M. Sipprelle finds the Model 275A has time for additional chores around the 250 acre plant area *and in the 35 acre underground quarry*. For example, a dozer was formerly used underground to push up shots. But the versatile Tractor Shovel piles stone higher—making loading out by swing shovels or the Michigan more efficient.

After loading, the 50 ft wide by 22 ft high quarry headings must be cleaned before the jumbo drill rigs can re-enter. The 28 mph Michigan runs over from stockpile or pug mill, cleans up, and is back on its original job in 35 minutes or less. Time spent *on the cleanup work alone* is less than half that formerly required by the crawler.

To all these production advantages, the Michigan has the added advantage of *greatly reduced maintenance*. Equipped with abrasion-resistant wide-base rock tires, all problems of costly track wear and repair have been eliminated.

Buckets to 12 yds

We'd like to show you first-hand how a Michigan Tractor Shovel's power, speed and versatility can pay off on your job. Choose from nine models, with lifting capacities ranging from 2,900 to 29,000 lbs, then give us a call. We'll be glad to arrange a demonstration—at no cost to you and no obligation!

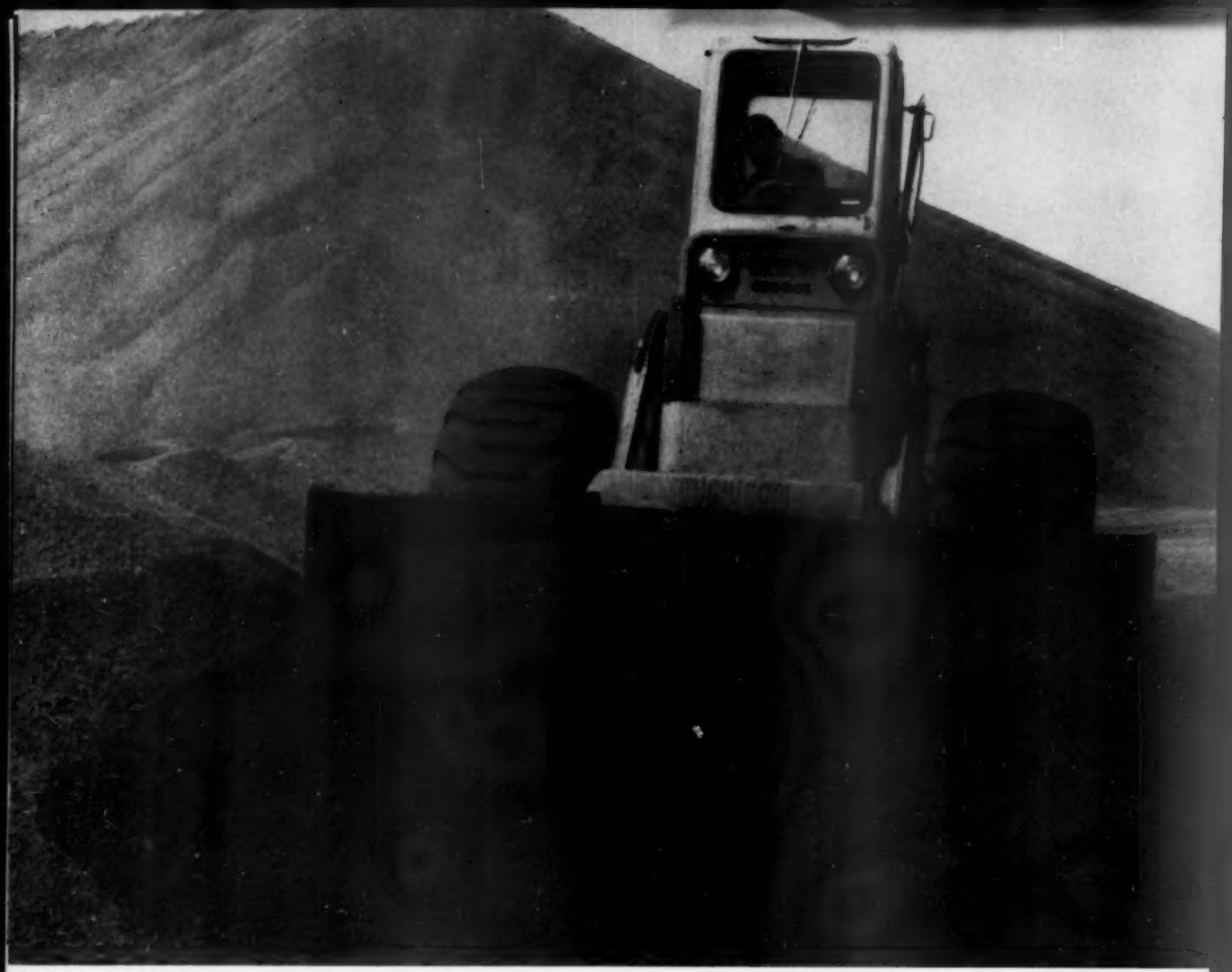
Michigan is a registered trademark of

CLARK EQUIPMENT COMPANY
Construction Machinery Division

CLARK® EQUIPMENT

2481 Pipestone Road
Benton Harbor 44, Michigan

In Canada:
Canadian Clark, Ltd.
St. Thomas, Ontario



Material: *iron ore pellets from Mesabi*

Rubber-tired machines

From a distance it looks like any other stockpiled material. Then you come close and you see this is *something different*. You've heard the name. It's *taconite!* Round pellets, varying from a half-inch to three-fourths inch in diameter, blue-gray in color, containing about 64% processed iron ore.

When rubber-tired machines can handle such material *successfully*—day in and day out—with rubber's obvious advantages of mobility and no track wear—that's real news for maintenance-minded firms that have almost *any sort* of stockpile problem.

This Minnesota taconite plant has *five rubber-tired Michigans*. These include a 2¾ yd Model 175A, a 2¼ yd 125A, and two 1¼ yd 75A Tractor Shovels . . . and the 262 hp Model 280 Tractor Dozer pictured. The Tractor Dozer exemplifies Michigan advantages . . .

Advantage No. 1—Tire Life

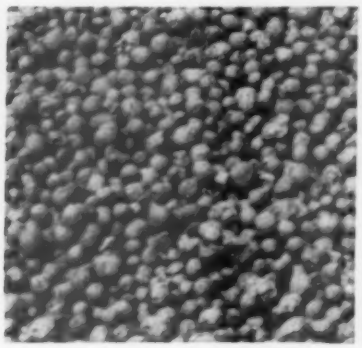
This 56,000 lb machine started work about a year ago. To date, its tires show virtually no wear. The machine does a variety of jobs. For example . . .

Advantage No. 2—Mobility

1. Levels the multi-million ton taconite pellet stockpile. Unit works on 2-to-1 and 3-to-1 slopes, has surprised men on the job with its ability to climb steep grades on loose footing.

2. Cleans around the 10-yard pellet-loading shovel. Major advantage in this operation is how Michigan's low-pressure tires don't crush the pellets

This is processed taconite ... loose, heavy pellets.



Rubber-tired Michigan proves ideal for handling.

Rig works steep grades, compacts without powdering.

Range taconite—abrasive, heavy

the only practical solution

. . . a real problem with crawlers.

3. Maintains haul roads.

4. Tows disabled trucks.

5. Cleans up around pellet plant. Unit gets to this assignment, 2 miles away by road, at speeds up to 28 mph, travels under own power without waste of lowboy loading or unloading, does no damage to railroad tracks or blacktop paving.

6. Cleans under loading pocket. Here, operator dozes normally until he accumulates load. Then he hydraulically pivots blade back, lifts material, turns and dumps outside the railroad tracks.

Advantage No. 3—Dependability

Key to Michigan success, however, has been dependability! Entire power train of each machine—torque converter, power shift transmission, planetary axles—is designed and built by Clark, specifically engineered to give more usable power and traction than you've ever seen on rubber. Get the proof of a demonstration. Four Michigan Tractor Dozer models—162 to 600 hp—eight Michigan Tractor Shovels—16 cubic feet to 6 cubic yards—to choose from. Also a full line of Tractor Scrapers . . . 10½, 19 and 29 cubic yards.

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HERBERT JAHNCKE

How one producer beat a secondary boycott

by Joseph N. Bell

Part 4 of Rock Products' *Labor Series: Producers in New Orleans, lead by Jahncke Service, Inc., proved that management can stand steadfast on its own principles without being inundated by powerful labor coalitions in succeeding negotiations*

IN JUNE 1959, New Orleans ready-mixed concrete producers signed a three-year contract with the Teamsters Union in which all of the union's demands—with the exception of a wage increase—were successfully rejected by the producers. And the wage increase finally granted was but a fraction of the original union demands.

The contract was negotiated without a strike and with a minimum of strife. This fact is significant because it was the first industry-wide negotiation in New Orleans between ready-mixed concrete producers and the unions since a vitriolic —and sometimes violent—labor dispute in 1956. Timid rock operators in other parts of the country who are running scared in the face of excessive union demands can look with reassurance to New Orleans where producers—led by Jahncke Service, Inc.—proved that management can stand steadfastly on its own principles without being inundated by powerful labor coalitions in succeeding negotiations.

There has been considerable labor unrest in the ready-mixed concrete industries in New Orleans since 1953, when the Teamsters—who were not then certified by the NLRB to negotiate in all of the companies involved—struck the ready-mixed concrete industry in an effort to force an hourly increase that producers insisted would virtually bankrupt them.

The strike lasted seven weeks—until the companies were able to obtain an injunction halting picketing after the union declined to take a strike vote on the producers' 7½¢-per-hour-increase offer. After this donnybrook, New Orleans producers were expecting difficulties when a contract renewal with the Teamsters—who had since been certified to negotiate—came up again in 1956. Although the producers weren't disappointed, the trouble came from an unexpected direction.

Negotiations on behalf of the producers were being handled by a committee selected by a group of employers representing all but three relatively small ready-mixed concrete companies in the New Orleans area. Chairman of the negotiating committee was Herbert Jahncke, the wiry, amiable vice-president and treasurer of Jahncke Service—by far the largest of the New Orleans ready-mixed concrete producers. Serving with Jahncke on the employers' negotiating committee were James Schwartz of Louisiana Industries and Bert Weaver, Jr., of Weaver Materials, Inc.

"Most of the time," Herbert Jahncke told me, "we fight like the devil, but when we get to labor matters, we can pull the group together."

As it turned out, however, the blow—when it came in 1956—was directed not at the entire group, but at Jahncke, alone. The negotiating committee concluded a successful negotiation with the Teamsters on Aug. 14, 1956; only the formality of signing a new three-year contract remained. Negotiators had scattered, relieved that the long, tortuous negotiating sessions were over. Herbert Jahncke was vacationing in North Carolina when, on Aug. 20, 1956, picket lines appeared at a number of Jahncke establishments in New Orleans and vicinity.

According to signs carried by the pickets, they represented the Seafarers International Union, aided and abetted by the Operating Engineers. Although neither union had been certified to negotiate for Jahncke employes, they were picketing to secure better terms and conditions of employment for the crane operators whom the Operating Engineers sought to represent, and the marine employes whom the Seafarers sought to represent.

The Teamsters refused to cross the picket lines, thus immobilizing Jahncke operations. Jahncke, however, immediately launched a counter-offensive of its own. In a letter to its customers, the company said:

"On August 14th, we signed a three-year contract with the Teamsters Union. On the following Monday the Seafarers International Union and the International Union of Operating Engineers placed pickets at all of our yards, with the exception of the Lumber Yard, and the Teamsters instructed their members not to cross these picket lines. This action was taken without any notice to us and without any demands being placed upon us. As a matter of fact, until yesterday, no one had asked us to meet with them.

"According to the placards carried by the pickets they are organizational pickets and, although they

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do not represent any of our employes, they apparently have the legal right to peacefully picket our yards. We notified the Teamsters that unless they returned to work immediately, we would be forced to replace them with new employes. This we have done and are ready to serve you."

Their original gambit having failed, the picketing unions extended their operations to construction sites where Jahncke trucks were making deliveries, "in spite of the fact (in the words of the later decision of the NLRB) that the truck drivers, who were not directly involved in the dispute, entered and left Jahncke's plants from 8 to 16 times during the course of a day's work to report and load their trucks."

In their brief to the NLRB, the unions "admit that they engaged in picketing at the construction sites in order to bring to the attention of the contractors and their employes working there the facts of the . . . . dispute with Jahncke."

The secondary picketing hurt Jahncke's business immediately and severely. Employes at a number of construction sites refused to handle Jahncke's materials or to work while the picket lines were maintained. Again, according to the NLRB report: "It is clear that an object of the picketing was to force and require employers who were wholly unconcerned in the dispute to cease doing business with Jahncke."

In the meantime, the company stayed aggressively on the offensive. Early in September, it sent a letter to its employes, saying, in part:

"You have now been out of work for two full weeks. Three years ago your Teamsters' strike lasted almost eight weeks. We are prepared to carry the present fight for eight months or more, if necessary.

"The S.I.U. and the Hoisting Engineers placed pickets on our Yards without notice. The Law provides a method for them to peacefully organize our men and request an election. If these Unions represented a majority of our employes we would have no objection to negotiating with them. That is the way your Union got to represent you, and that is the only fair way for unions to get to represent men. It is not only unfair to Jahncke but also to you for them to force you out of your jobs by picketing.

"You have nothing to gain and everything to lose in this fight. Nobody is being turned out of work except you. We are carrying on our business as usual. You are not receiving any benefits from the Union, and today you will miss your first pay check; moreover, you can't get any relief money because the state does not allow unemployment compensation to be paid where there is a picket line and men refuse to go through it, in a case like this.

"A number of our men have already returned, and we have received calls from dozens of others who say they will be back to work on Tuesday and have asked us to help them out because they are missing this pay-day. We would be willing to advance on Tuesday some cash against future pay checks to those who return to work next Tuesday and who are in need."

With its trucks manned and its plants producing, Jahncke turned to the problem of acceptance of its materials. At a growing number of construc-

"In many cities, group bargaining was done in name only and producers were often divided among themselves as to how to deal with the unions. The techniques used in group bargaining were improvised, and there was no solid industry position on fundamental policies.

"Now our industry has begun to realize that, for better or for worse, we must stick together in group bargaining or permit the unions to divide and conquer. Perhaps nothing did more to encourage the development of solid techniques of group bargaining than the discovery that, under circumstances set forth by our counsel, C. A. Horsky, employers could use the reciprocal lockout whenever unions tried to divide and conquer by shutting down only one plant, or shutting down all plants but one. The unions have learned in many cities that our industry will not be separated in its group bargaining negotiations."

VINCENT P. AHEARN, Managing Director
National Sand & Gravel Association

tion sites, Jahncke materials were being rejected by contractors whose union help refused to work if Jahncke products were brought through the pickets.

Typical of the dozens of construction site incidents is this one, reported by a Jahncke supervisor: "This morning we were scheduled to deliver concrete to the Airline Park School. In order to assure ourselves that no pickets would be available to follow the trucks, the first three trucks were dummy loads. As these trucks pulled away from the plant, the pickets in their automobiles immediately followed them. Then two trucks were loaded with the material to be delivered. Upon arrival of the first truck which backed up to the crane, the operator phoned his Business Agent. He then stated that he had a wife and children to support, was not going to become implicated in violation of Union rules and would not unload the concrete. The other crafts on the job sensed that the operator was questioning the advisability of handling the material. The various crafts one by one started to walk off the job and go to their cars. These crafts included the plumbers, electricians and the carpenters and, finally, the laborers.

"The contractor then requested removal of the Jahncke Service trucks, which was done. Immediately, the craft foremen began calling to the men who were leaving to come back to work. The men, seeing that the trucks were leaving did return to the job."

In most instances, the pickets were very careful to avoid inciting any trouble that might be legally held against them. But inevitably, incidents of rough talking or rough handling arose. And Jahncke employes were alert. They had been instructed, in writing, to note immediately and carefully:

- Everything done and said by people carrying picket signs;
- Exact wording of any threats uttered and identification of individuals uttering them;
- Appearance of any union officials;
- Evidence that employes of customers had been contacted or intimidated by the picketing unions and told not to handle Jahncke materials.

Drivers were questioned carefully after each delivery, and their comments transcribed. This meticulous attention to detail paid off handsomely. Jahncke attorneys went to court and requested an injunction against the picketing. On Sept. 10, the civil district court of New Orleans issued a temporary restraining order, and the picket lines disappeared. Although the court order was dissolved on Sept. 21 on grounds that the state court had no jurisdiction in matters "vested in the National Labor Relations Board," the back of the strike was broken and the pickets never reappeared. A later, similar injunction issued by Federal District Judge J. Skelly Wright on Oct. 9 put new teeth in the earlier restraining order.

In subsequent hearings before an NLRB trial examiner, a strong case, backed by well-documented evidence, was presented by Jahncke, and on March 6, 1957, the examiner ordered the SIU and the Operating Engineers to: "cease and desist from engaging in or inducing or encouraging the employes of any employer other than Jahncke Service, Inc., to engage in a strike or concerted refusal in the course of their employment to use, manufacture, process, transport or otherwise handle or work on any goods, articles, materials or commodities, or to perform any services where an object thereof is to force or require any employer or other person to cease using or handling the products of Jahncke Service, Inc., or to cease doing business with that company or to force or require Jahncke Service, Inc., to recognize or bargain with the Respondent Operating Engineers and the Respondent Seafarers as the representatives of any of Jahncke's employes unless the Respondents have been certified as the representatives of such employes under the provisions of Section 9 of the Act."

This ruling was later substantially upheld by the National Labor Relations Board in Washington.

What did victory cost? A few shattered illusions, says Herbert Jahncke, and a great deal of money. Where, specifically, does the cost of slugging it out with a union arise? Jahncke suggests five major sources:

- Insurance against violence;
- Additional legal fees;
- Equipment damaged by new employes unfamiliar with its care and operation;
- Loss of business;
- Services of extra watchmen.

And the shattered illusions? "Most of the support we got," recalls Jahncke, without rancor, "was lip service. I suppose that's understandable. There was tremendous pressure put on our customers and tremendous demands put on our competitors. But even so, when a company carries a fight all alone, it gets hungry for some tangible support."

So far, there have been no disastrous after-ef-

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fects of the picketing fight. Since 1956, the two maverick locals that picketed Jahncke have given no trouble to New Orleans ready-mixed concrete producers. And, as noted earlier, a three-year contract was signed with the Teamsters by New Orleans producers last year with a minimum of concessions by management.

According to Herbert Jahncke: "We were able to do as well as we did in the 1959 negotiations because we presented a firm, united front. The producers gave full authority to the negotiating committee and backed us up 100 percent."

This, perhaps, is the major lesson to come out of a dispute in which one company carried the brunt of the battle. Few single companies are equipped —as was Jahncke Service—to hold the line alone. And even this company says emphatically: "We must present a firm and united front."

After long—and successful—experience in dealing with unions, what suggestions would Herbert Jahncke offer other rock producers to help them in their labor negotiations? He lists five principles as paramount:

1. Develop patience over and above the call of duty. This is absolutely basic. Any successful management negotiator must have the patience to sit through lengthy and frequently bombastic meetings day after day—and the fortitude to stand his ground.

2. Respect the men with whom you are dealing —and don't ever underrate the opposition. This is a fatal mistake.

3. Don't just pay lip service to cooperative bargaining with other operators in your field. Be realistic about it. It's going to be tough, because you may frequently disagree with the consensus of the group, and you may not like some of your partners. But if you agree to cooperate, do it—and don't just talk about it.

4. Refuse unequivocally to be intimidated, no matter what the duress. This doesn't mean you have a right to be tyrannical. But it does mean that you have a right to your position and principles, and you must stand up for them.

5. Once you've decided on a course of action, take the ball and carry it. Don't be indecisive or wishy-washy. Your course may be expensive. You should know this ahead of time and be prepared to foot the bill if necessary to follow through on the plan you've chosen.

These points are not easy to implement. Under some circumstances, they may appear almost impossible. Why? Herbert Jahncke told me: "Our industry is overcrowded in many parts of the country and rife with competition. This situation frequently creates a feeling of antagonism that makes it very difficult for competitors to sit around a table and work out a cooperative plan of action in labor matters.

"There are always the producers who think they can feather their own nest by making a separate deal. These people have to learn the hard way that the business they take from other plants that are standing up to a union in a labor dispute is never permanent—and frequently leaves them with less than they had before."

But in New Orleans—as in every other labor trouble spot visited by ROCK PRODUCTS reporters —one maxim came through, again and again: stick together. Only by cooperative action can individual rock producers combat growing union power. And this action must be realistic and firm—based on a prior understanding of the difficulties involved and shored up with an unshakable determination to hold the management group together until the negotiations are successfully concluded.

This is the concluding article of a four-part ROCK PRODUCTS series on labor problems in the rock industries.

By presenting case histories of rock producers who have successfully negotiated with unions in the face of diverse and adverse circumstances, we have tried to offer our readers a bedrock series of suggestions to help guide them in handling their own labor problems.

If we have been able to offer one idea to one producer that will help him take a stand against union pressure for principles in which he believes —and which he knows are necessary to operate a successful and profitable business—then we would consider this series successful.

Time and again in editorial surveys, labor problems have been shown to be a topic of prime interest to rock producers. Accordingly, ROCK PRODUCTS will continue its close coverage of the labor news front and will offer—from time to time—other feature series on labor matters, designed to help rock products operators by enabling them to share the experiences of other rock producers in all parts of the country.

Self-dumping units speed bulk shipment of marble chips at Georgia Marble Co.

Steel hoppers flip themselves

FOR AN OCCASIONAL ORDER for bulk shipment, it's easy to fit 1-cu. yd. steel hopper under spout of bag packing machine

THE LOADED HOPPER flips over when the operator trips a lever. The empty hopper snaps back automatically and latches securely into loading position

SELF-DUMPING HOPPERS have helped the Calcium Products Div. of the Georgia Marble Co., Tate, Ga., to reduce the cost of handling bulk shipments from the several calcium products plants not geared to ship bulk products.

The steel hoppers have a 1-cu. yd. capacity and are self-dumping, self-righting and self-locking units. They can easily be transported by either fork trucks or by hydraulic platform trucks. Because of these automatic features, the truck operator is the only man required for the operation.

Here's how the hoppers fit into the bulk handling operation:

A fork truck positions the hopper beneath the discharge chute of a storage bin or next to a valve-type bag packer. When the hopper is full, the fork truck transports it to the loading dock and a waiting truck or railcar.

The fork truck operator flips the release handle on the rear of the hopper which automatically dumps the load. Positive dumping action of the hopper empties it completely preventing future product contamination. After dumping, the hopper rights and locks itself and is ready to be returned to the reloading point.

When hoppers are not handling bulk materials, they are used for plant housekeeping jobs. During routine plant clean-ups, hoppers are positioned so that crews can shovel waste directly into them. When filled, they are delivered to a dump truck. The hoppers have also proved useful to crews shoveling up spillage.

Production personnel of the Calcium Products Div. estimate a 10 percent reduction in labor cost and bulk handling operations since the introduction of the hoppers. END

MAJOR EQUIPMENT REFERENCE: 1-yd. steel hopper, Roura Iron Works, Inc., Detroit, Mich.

Producers know they can't get along without engineering. But many haven't scratched the surface of potential profits through use of wise engineering counsel. This article tells you where to get it

"ENGINEER" YOUR PROFITS

MODERN ENGINEERING is becoming increasingly vital to profits in the aggregate industry in this age when design or operating mistakes become more costly with each passing day. Under today's operating conditions—costs going up, competition getting keener and profits being squeezed—the industry is turning to engineering for its survival.

Just a year ago ROCK PRODUCTS' annual report to the aggregates industries highlighted the need to invest wisely for improvement in efficiency—hence, profits. Prudent operators have proved to themselves that capital expenditures for new machinery and processes can pay out in higher quality products at a lower cost of production. Some have proved that mere existence as a profitable operation depended on continued investment.

Capital investment made only for adding machinery or process to plant or quarry is no guarantee to success. A program for improvement and expansion has to be studied completely to get desired results. It has to be engineered.

Many kinds of engineering—and other services—must be considered. No longer is it sufficient to depend upon a 1-man engineering staff for complete study of, say, an equipment replacement to eliminate a costly production bottleneck. That man may be an excellent engineer, with many years of good experience.

But this is the age of specialists. Even the best engineer finds it nigh impossible to be an expert in every line. There's simply too much research and application experience for any one engineer to digest and use. And unless these developments are considered in solving a problem, the best answer may not be achieved.

Today's engineer must be part of a team that studies a problem and comes up with the right solution—for your operating economics and the market's demands. Suppose, for instance, that you decide to survey your plant to look for opportunities to improve efficiency. One suggestion involves a detailed analysis of each operating step in the system—from the initial one to the final stage of production. Every piece of production, transportation and processing equipment should be studied from an actual, rated and desired output standpoint.

Results of the study should be reviewed in light of the best possible combination of output rates in each step. The most effective operating condition would be perfect balance of material flow, using the most economical capacity of each individual piece and type of equipment involved.

Assume that you found in your plant one screen that was a bottleneck to production. It was giving service at much less than its rated capacity, and sizes it produced didn't give the maximum revenue. What types of work are involved in making the study and getting the most economical solution possible?

The following are suggested as some of the specialty services required: engineers—research, industrial, power, electrical, mechanical, materials flow; other experts—marketing, economists, sales, production and financial. These and others combine to form the team that will give you the proper and best answer to the problem.

Your own imagination and experience will point up the extent of special services needed to build a completely new original or replacement unit. It's not a job for one man. Yet, many properties are of such size that only one engineer—or none at all—can be used for such work. Does this mean that there's no hope for improvement or advancement; that small size in itself is an economic disadvantage? No!

Help is available. And it's available to the degree you need it whether your plant or company is large or small. Some help comes under the head of

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"ENGINEER" YOUR PROFITS

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"services" provided by equipment and parts manufacturers, and from others.

Professional assistance in the form of individual consultants or consulting engineering firms is available. This is pure engineering. It carries with it an objective view of the problem, including a wide acquaintance with the ability and efficiency of equipment and processes, regardless of type of manufacture. There are many forms of this talent. It may be applied to simply finding out what a producer's problem is. It could be used to recommend a solution to that problem, whether it be large or small. Or it may be used to do a complete job on a big, new project, including construction.

Furthermore, helpful services of several types, including engineering and testing, can be had by members of national industry and professional associations and institutes.

Let's review how and to what extent you can be served by these various sources of aid.

Equipment and parts manufacturers can supply many types of engineering and other assistance. Normally, this help is termed "service" which is given to customers or potential customers for the asking. It is based primarily on information relating to the application of the specific products supplied to the industry by the manufacturer.

Basic research and application engineering, plus long years of experience, give the manufacturers bounteous information about their equipment and products that can be passed on to the industry producer. Virtually all manufacturers have such information and can apply it to a solution of a current problem. In fact, machinery and supply houses use these data themselves to continuously improve their regular products or to design new ones that will do a better and more economical job. That is a basic service manufacturers supply. And in many cases, new developments in equipment—or new equipment—are worked out in cooperation with an industry producer or group of producers.

A survey among equipment or parts builders reveals a wide variety of service that is yours if you want it. It ranges from printed product releases to complete engineering job analysis, with many in-between aids.

Engineering advice and counsel was mentioned most often in the survey. Variety of services that machinery builders are able to provide include job analysis, plant or plant section layout, cost estimates, engineering data and even consulting services in the form of personnel trained as special application consultants. One manufacturer has formed an Operations Research department. In this work, even principles of philosophy are being applied to operating problems before they get to the engineering department.

A manufacturer writes: "We have . . . provided basic and preliminary layouts, information, proposals and descriptive operation information so that the customer could begin to understand what would be required to do the job best at the lowest economic levels."

This type of service is fairly widespread among all machinery makers, whether they be large or small. Each has a background of knowledge of its own equipment, and has trained personnel to help you with your problem.

Importance of your problems is recognized by those who supply equipment for your use. Several companies stated that they have one or more sales engineers who spend all their time working with aggregates producers. They're on call to give any assistance you need, specifically if service involves application or use of their type of equipment. Here's what one manufacturer thinks of personalized service provided by its field force of application engineers and servicemen: "It is through these men, and not through any type of prepared material, that [the company] helps quarry operators throughout the nation operate . . . their businesses with as much efficiency and as much profit as possible."

Many manufacturers can give you help in finding your costs, especially in the operating area covered by their equipment. Some will analyze your job and suggest a better way of handling the equipment to improve its efficiency. A reduction of cost is the planned result. Others say they'll do that and then some. They'll even "aid the owner in determining what is the most economical time to replace old equipment with new." This is a real service, since obsolescence and depreciation are such big headaches.

Research and testing is another service mentioned often in the returns to our survey of manufacturers. Two types of this work are offered. One is concerned with laboratory and pilot plant work on raw materials or products from your property, to find answers to your specific material, equipment or operating problems. Another is research and testing devoted to improvement of the manufacturers equipment or the development of new machines for your eventual benefit. Almost all ma-

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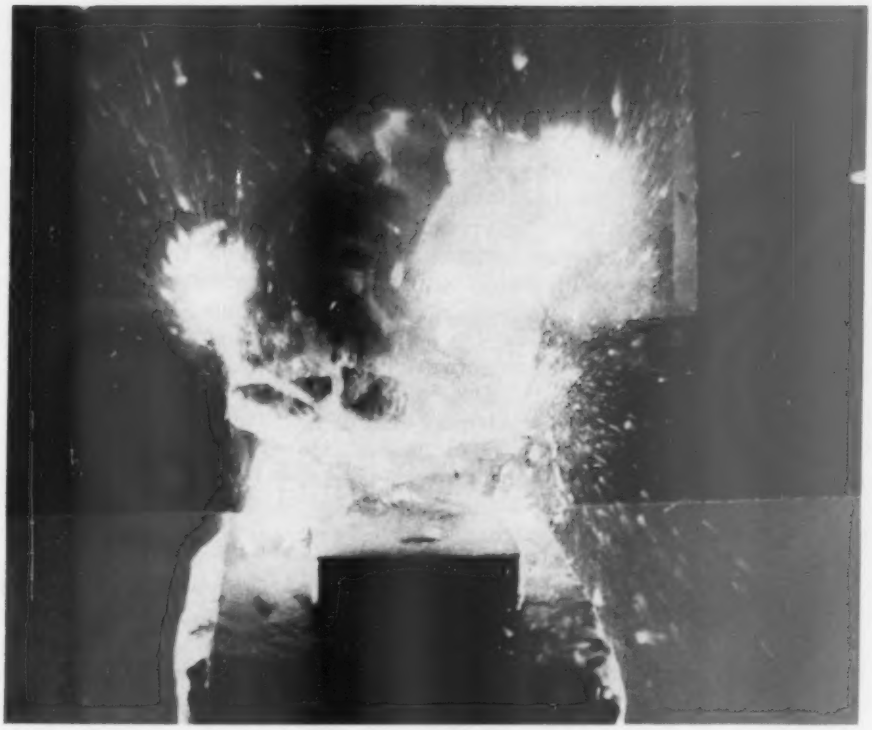

RESEARCH on raw products leads to solution of operating problems, development of more effective equipment, and design of new machinery *(Photo, courtesy Allis-Chalmers Manufacturing Co.)*

COMPLETE ENGINEERING was the route taken in designing and building this $5 million plant

JOINT DISCUSSION of problems between producer, consultant or engineering firm helps to determine course of action *(Photo, courtesy Western-Knapp Engineering Co.)*

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chine makers have facilities for the latter; some have quite complete facilities for the former.

Testing your raw material or product may provide a basis for equipment specification and recommendation. As one manufacturer put it: "Such steps in a 'before' research approach could mean dollars saved in possible mistakes later, as far as equipment and methods [are concerned]." Another well-known company with completely staffed laboratory says its work for customers has "eliminated a lot of headaches and financial loss" for producers through advice to them on whether or not to work a deposit under consideration.

That same company, through use of its pilot washing, classifying and dehydrating plant, tests new ideas "so that the customer is not the 'guinea pig'." It reports that some new ideas have been adopted through this work, and just as many have proved to be impractical.

Many company laboratories are completely equipped to do a sizeable job for producers. They can run batch or continuous pilot mill tests on crushing, grinding, screening, classification, concentration, and assays and analyses. From use of such facilities, data are produced to design material treatment schemes, to determine flow diagrams for new or rehabilitated plants or to determine machine capacities and the kind of products made by them.

Manufacturer research for development of new or improved equipment has been of great assistance to the aggregates producer—particularly in recent years. Some companies do considerable basic research, to find out possible new ways of doing crushing, screening or other jobs so prevalent in the industry.

Most newly developed or improved equipment is fully tested in mock setups to prove machinery efficiency, probable maintenance requirements, stability, toughness, etc., before it is made commercially available. This might be called "customer protection," and it may serve to set company guarantees on equipment.

What's the cost of all this engineering advice and counsel? A few manufacturers specifically stated that it was offered "free of charge." Others, although not being that specific, implied that the service was available free to those who considered the purchase of the type of equipment they made or handled.

Logic dictates that someone must pay for this service, and apparently most manufacturers absorb the charge. Use of the service will accustom the industry to engineering for profits.

Other manufacturers' services are available to you. By far the most common type is printed or other types of information that can be of assistance. Brochures, catalogs, releases, service tips, operational aids, field operation reports—these and many more are yours for the asking.

Training programs for equipment or plant operators' benefit have been found helpful. Visual aids are becoming more popular. Other training services include service specialists and demonstrators who guide and assist clients in proper operation and maintenance of equipment. Some companies conduct periodic service schools for customers' mechanics. Other schools for mechanics or mechanical superintendents conduct training courses in factory-recommended procedures for repair and the maintenance of the manufacturers' equipment.

Space doesn't permit full discussion of all types of services that equipment makers and parts suppliers offer. Our survey, though, pointed up the general attitude of manufacturers to provide service to customers and potential customers. This manufacturer's quote expresses the attitude fairly well: "Virtually every client and customer has a different problem. It is our job to help him solve it. We can do that only by working closely with him, supplying the best possible products, equipment and services when he needs it."

How about professional engineering advice, counsel and performance? It's available, and many producers are taking advantage of it.

Some producers may find our particular classification troublesome. It is not implied to mean that some personnel affiliated with manufacturers are not professionals, for many are. But our distinction is meant to point up the difference primarily in affiliation and purpose. Possibly "independent consulants" would be a more proper term—those trained and experienced professional engineers or company of experts whose primary business is engineering service not affiliated with the sale of equipment or processes. Their viewpoint of engineering service to industry is the objective one.

The specialized service you can get from independent consultants includes information on all types of equipment which is available from all manufacturers. Consultants or consulting firms constantly collect and analyze such data from all sources. Thus, they have complete knowledge of all

Please turn to page 154

TOOL UP FOR EFFICIENCY...

by Elwood Meschter

WHAT kind of tools does the enterprising, aggressive rock products producer need to improve his efficiency? On the following pages we have gathered some of the outstanding developments in transportation, conveying, processing and other types that have been called to your attention in the last few months. These are sectionalized by phase of operation.

Naturally, it would be impractical to show every possible piece of equipment that could improve an aggregate producer's efficiency. But the items used should illustrate clearly—if illumination is needed—that manufacturers are working continuously to offer equipment that will do a better job for a producer and give him a higher return on his investment than ever before.

This return on investment is important. Most producers are aware that they must spend money to make money. In this day of competitive stress it is more true than ever before. The problem then becomes: how to spend the money for the best return.

Not every one of these items will be equally useful for every aggregate producer. But if a single piece of equipment shown here pays off for a single producer, it will have made the time and effort of the manufacturers well worth while.

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TOOL UP FOR EFFICIENCY

continued from page 95

. . . in Quarrying

Opportunities for efficiency in the quarry are too numerous to mention. Almost every phase of the operation has had some outstanding new development in the past year, and many more are on their way. Since trucks are probably the producer's largest investment, there has been a great deal of manufacturing design and fabrication research to reduce the deadweight and increase the capacity of haulage trucks. This does not mean that other machines have been neglected—only that improvements have not been as spectacular or as well publicized. Right along with the concentration on haulage efficiency has come the realization that other factors influence truck operation. Haul road care is one of these factors. There has been new interest in haul road design and maintenance. We have shown several pieces of equipment that have previously been of interest only to contractors but have now become tools for the cost-conscious rock producer.

1—Where the mobility of truck mounting is desirable, this heavy-duty drill will give efficient operation. More than 100 ft. of drill rod can be stored, and the unit can drill holes up to 7⅞ in. diam. A separate diesel engine provides power for drilling, while hydraulic power with variable speed control can be varied between 0 and 100 rpm. The hydraulic pulldown can also be operated mechanically. *Bucyrus-Erie Co., Drill Div., Richmond, Ind.*

Enter 237 on Reader Card

2—A one-man, self-propelled drill provides exceptional drilling efficiency for blast holes from 1¾ to 4¼ in. diam. All controls are centralized at the drill within the reach of one man. Four speeds are possible between 20 and 450 rpm. An air-cooled, single-stage air compressor is rated at 200 cfm. displacement. Hydraulic power for two hydraulic motors is provided by a vane-type pump. The motors give plenty of torque for pull-down or hoisting. A gasoline engine is standard, but a choice of diesel engines with a torque converter is offered. *Gardner-Denver Co., Quincy, Ill.*

Enter 238 on Reader Card

3—Ripping has gained stature as a production tool. Rippers are used not only as a way for getting overburden loose enough to dig, but as a full-fledged production tool for limestones. Straight or forged shanks are offered to suit ripping conditions and they are mounted on a heavy tool beam. The whole assembly is raised or lowered hydraulically for a maximum ripping depth of about 42 in. The rippers are available for mounting on tractors made by several major manufacturers. *American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, California*

Enter 239 on Reader Card

4—A newly redesigned scraper is similar in appearance to previous machines in the line, but improvements have increased its productivity substantially. Outstanding new feature is a compact, 100-hp. turbocharged diesel engine to give the unit more effective power to work on difficult haul roads. *Caterpillar Tractor Co., Peoria, Ill.*

Enter 240 on Reader Card

5—Quarry efficiency can be improved with the use of a heavy-duty bulldozer. It can build up any scattered rock after blasting not only to clear the way for trucks, but to make it easier for the shovel to work the blasted rock. Then while the shovel is working, the dozer can clean up the spillage and keep material ahead of the shovel. *Clark Equipment Co., Benton Harbor, Michigan*

Enter 241 on Reader Card

6—Four big grader units are available for haulage road maintenance ranging from 83 to 160 hp. The design features have been developed as the result of extensive field tests. For example, the contour of the blade has been formed to give superior cutting and rolling action as the material is peeled off the surface of the roadway. The blade itself is 3 ft. high and 9 ft. long and is remote controlled. All models have six speeds forward and reverse, with creeper speeds available as optional equipment. *Huber-Warco Co., Marion, Ohio*

Enter 242 on Reader Card

7—Haulage trucks are getting bigger. Latest entry in the capacity push is a big 55-ton diesel electric truck. This unit has overcome some of the design limitations on big trucks by using an integral electric motor in each wheel. A 600-hp. diesel engine generates the power for these motors. However, this gives the big rig exceptional flexibility, and the maker claims that haulage costs can be reduced from 10 to 30 percent. Grades up to 15 percent can be navigated under full load, and the unit has a turning radius of about 25 ft. The electrical system permits electro-dynamic braking, power steering and power dumping. *Unit Rig & Equipment Co., P.O. Box 1889, Tulsa 1, Okla.*

Enter 243 on Reader Card

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8—An ingenious improvement in quarry haulage is known as "wagon train on rubber." It is made up of a truck with one or more trailing units of 15 or 25-ton capacity each. Each trailing wagon is controlled from the truck to provide fast dumping of the whole train. Two models are offered: one for highway use, the other for off-highway haulage. The larger units are powered by 300 or 385-hp. diesel engines and are built of alloy steel for high strength-to-weight ratios. *Differential Co., Findlay, Ohio*

Enter 244 on Reader Card

9—One of the largest two-axle haulage trucks ever made is a new 40-ton unit. Of conventional design, the rig is powered by a V-12 diesel engine coupled to a four-speed transmission-converter. *KW-Dart Truck Co., Kansas City, Mo.*

Enter 245 on Reader Card

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10—A big, new air-operated dragline can be equipped with a 3½ or 4-cu. yd. bucket, but it is flexible enough to handle a backhoe or a lifting boom rated at 110 tons. In spite of its size, the new shovel can be readily dismantled to be transported. The side frames can be removed without breaking the traction chain—only a single large bolt at each axle needs to be taken off. Diesel engines with torque converters or direct drives are offered. Brakes and clutches are oversize for long life and easy adjustment. *American Hoist & Derrick Co., 63 Robert St., St. Paul 7, Minn.*

Enter 246 on Reader Card

10

11—Fine rock or sand and gravel can be handled efficiently with buckets equipped with a newly designed tooth. The duck-bill shape of the tooth fills in the spaces normally left by the conventional pointed teeth. Field tests seem to show that spillage is greatly reduced and capacity increased when digging in fine, granular aggregates. *American Manganese Steel Div., 389 E. 14th St., Chicago Heights, Ill.*

Enter 247 on Reader Card

11

High-speed drilling efficiency is offered with this crawler-mounted drill rig. A low center of gravity and 10-in. wide tracks give stability in rough working areas. The tracks are spring-loaded to maintain tension. Lubricated track rollers can be easily removed for inspection or replacement. Two models are available—one for drilling 4-in. diam. holes and another for 2½ to 3-in. diam. blastholes. *LeRoi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.*

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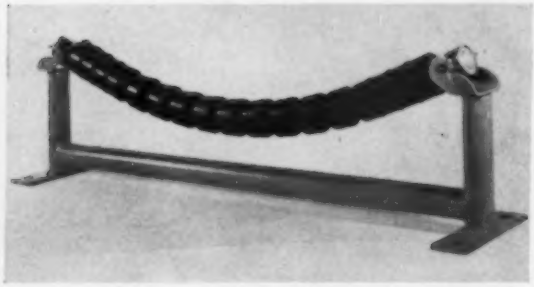

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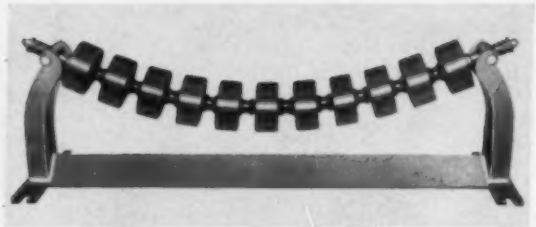

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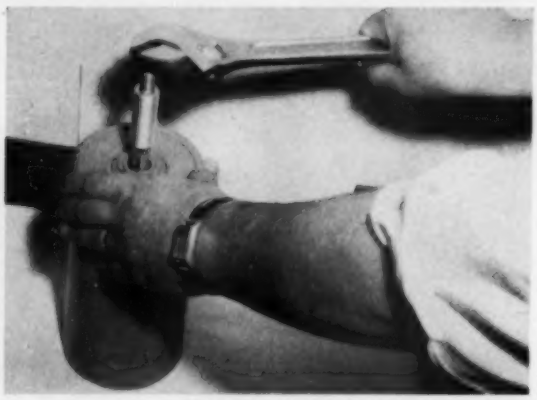

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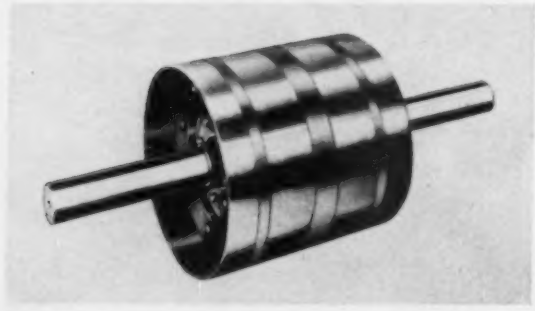

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TOOL UP FOR EFFICIENCY

continued from page 97

. . . in Conveying

Belt conveyor efficiency is usually a matter of close attention to detail when the conveyor is installed. It is usually more economical to attain efficiency then, than to rework the job after it has been in operation. Here are a few ideas for conveyor efficiency that can sometimes be profitably added to an installation that is working satisfactorily but needs only a few refinements to add extra profits.

12—Conveyor idlers mounted on shafts that flex to match the contour of the loaded belt have proven to be efficient, economical idlers for many applications. Here, neoprene discs are moulded to a neoprene-covered steel wire rope. This support is swaged into steel shanks to fit bearings. The idlers are available for conveyors ranging from 18 to 48 in. wide. A full line of carrying and return idlers is offered. *Joy Mfg. Co., Pittsburgh 22, Pa.*

Enter 249 on Reader Card

13—True catenary suspension for the loaded conveyor belt is offered with a new carrier. The new idler incorporates a flexible steel shaft with an initial set to provide a trough. The idler rolls themselves resist the action of corrosive, abrasive or oily materials. The roller assembly is self-cleaning as is the jig-welded steel supporting frame. Idlers are available for belt widths from 18 to 36 in. *Stephens-Adamson Manufacturing Co., Aurora, Illinois*

Enter 250 on Reader Card

14—Concrete is an economical structural material for supporting belt conveyors. Concrete shapes have been used as columns to support trusses and the head ends of long conveyors. The truss sections, themselves, can be made of T-section, prestressed members. *Watco Steel Forms, Post Office Box 1308, Plant City, Florida*

Enter 251 on Reader Card

15—Idler bearings can be quickly and easily removed with a new tool developed just for this purpose. Part of the tool is an expandable-head puller bolt. This is inserted in the inner race of the bearing and expanded. A few turns on a puller nut that fits over the shank of the bolt slips the bearing out of the idler shell. A replacement bearing of the correct design can be readily pressed into place. *Universal Engineering Corp., 625 C Ave. NW, Cedar Rapids, Iowa*

Enter 252 on Reader Card

16—Permanent magnet head pulleys on belt conveyors are a highly effective tool for taking out steel and other magnetic scrap from the flow of aggregates. A newly developed line of these pulleys is offered for wide conveyor belts—normally used for high-capacity conveying. The pulleys are made of a highly oriented barium ferrite ceramic material that gives good results at relatively low cost, and are said to equal the performance of electromagnetic pulleys. *Stearns Magnetic Products, 635 S. 28th, Milwaukee, Wis.*

Enter 253 on Reader Card

Heavy-duty replacement ball bearings are available for high-speed, heavily loaded conveyor idlers. They are offered in a range of hexagonal bores, round bores and fitted with stub shafts for idlers without through shafts. The bearings are suitable for replacement in either troughing or return idlers. These precision bearings are sealed and lubricated and need no additional lubrication after they are installed. *New Departure Div., GMC, Bristol, Conn.*

Enter 254 on Reader Card

A complete line of permanent magnet head pulleys offers the aggregates producer the opportunity to match a pulley with the needs of his installation. Two standard designs are of-

fered. One is especially effective to remove heavy tramp from a deep flow of material—making it ideal for protecting crushers and mills from magnetic scrap. The other provides a shallow but intense field of magnetism to take out relatively fine magnetic scrap from sand and other fine aggregates. These permanent magnet pulleys are offered in diameters from 8 to 36 in. and for belt widths up to 60 in. *Eriez Mfg. Co., Erie, Pennsylvania*

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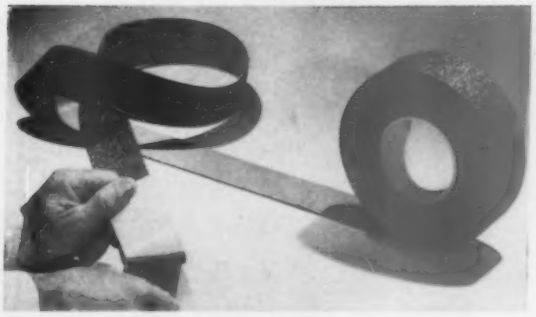

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17—The advantages of lagged head pulleys can be achieved with a lagging strip that can be applied in the field. The strip is coated on one side with non-abrasive resilient particles that improve the coefficient of friction between the pulley and the conveyor belt. The other side of the strip is coated with a pressure-sensitive adhesive that sticks to metal at a touch. The lagging is offered in 96-ft. rolls in either 2 or 4-in. widths. *Minnesota Mining & Manufacturng Co., 900 Bush Ave., St. Paul 6, Minnesota*

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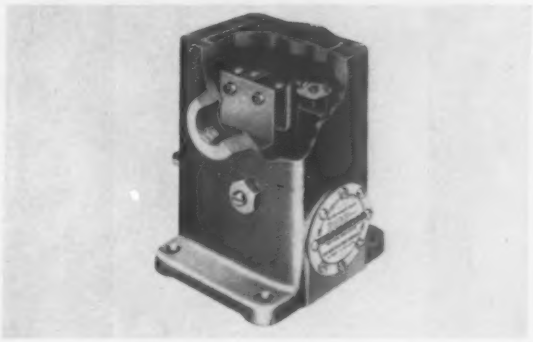

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18—A new conveyor switch provides the signal that puts conveyors under automatic control. When this new switch is connected to a head pulley shaft or any other rotating part of the conveyor, it converts the rotary motion into an impulse. This signal can be hooked into an alarm circuit or into circuits that control other pieces of equipment—feeders, crushers or other conveyors. *The Bin Dicator Co., 13946 Kercheval Ave., Detroit 15, Michigan*

Enter 257 on Reader Card

19—This rotary switch can find good use where the action of a loaded belt conveyor is needed to control other operations. These can include sprays and other hydraulically operated equipment tied to the conveying system. The control can be adapted to control electrically operated equipment. In this way it becomes a safety device as well as a process control tool. *Megator Corp., 900 Manchester Ave., Pittsburgh 12, Pa.*

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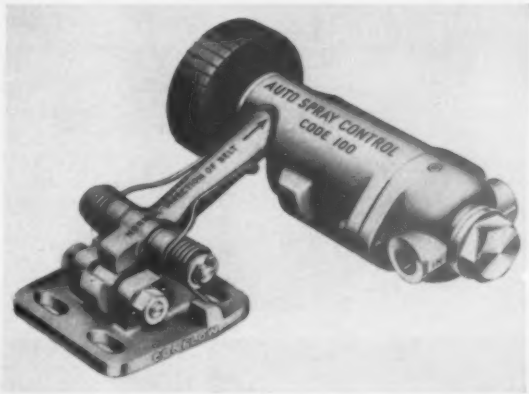

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20—Now 45-deg. troughing idlers can be used with a heavy-duty conveyor belt. The advantages of these deep troughing idlers can be realized with the use of this new belt. Its special construction lets the belt bend to suit the contour of the idlers without loss of strength or carrying capacity. The manufacturer guarantees the belt against ply or cover separation at the hinge points when the belt is used with 45-deg. troughing idlers. *Manhattan Rubber Div., Raybestos-Manhattan, Inc., Passaic, New Jersey*

Enter 259 on Reader Card

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21—This new conveyor belt protects against the hazards of premature failure due to moisture penetration, impact or fatigue. At the same time, the new belt can be used with 45-deg. troughing idlers instead of the conventional 20-deg. idlers to achieve greatly increased capacity. Along with the greater flexibility of the belt's carcass comes reduced weight, thinner body and fewer plies. The belt is able to withstand heavy blows and the impact of sharp rock without damage. *Boston Woven Hose & Rubber Div., American Biltrite Rubber Co., P.O. Box 1071, Boston 3, Mass.*

Enter 260 on Reader Card

A new conveyor belt makes it possible to maintain conveyor capacity at steep inclines up to 21 deg. when handling wet materials. The surface of the belt has moulded rubber cleats in the form of chevrons. When the point of the cleat is in same direction as the belt travel, water tends to run off the sides and achieves a dewatering effect. When the open end of the cleat is in the direction of travel, the belt tends to retain water but prevents the load from slipping back. The new belt is offered in widths from 12 to 30 in., with top and bottom covers to suit the characteristics of the materials handled. *Hewitt-Robins, Inc., 666 Glenbrook Rd., Stamford, Conn.*

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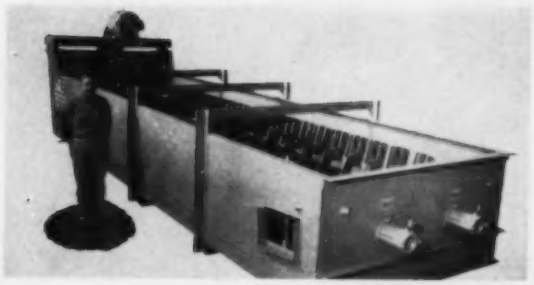

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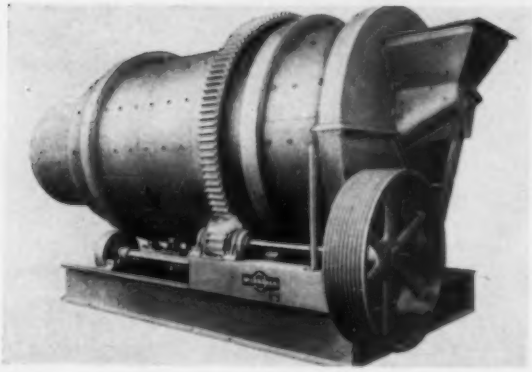

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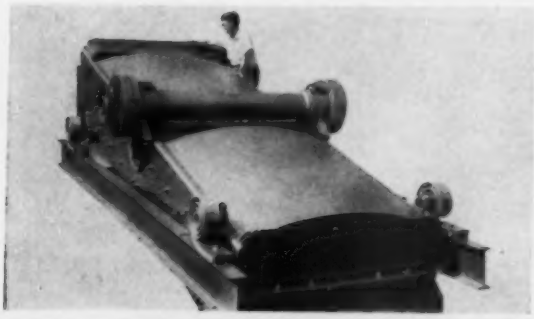

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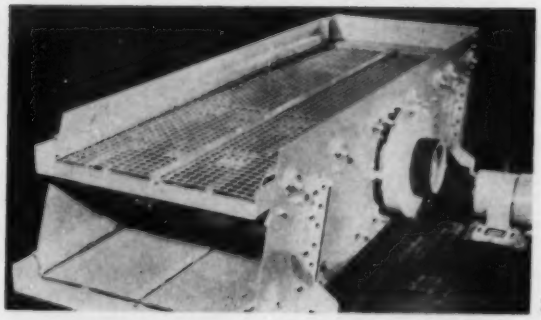

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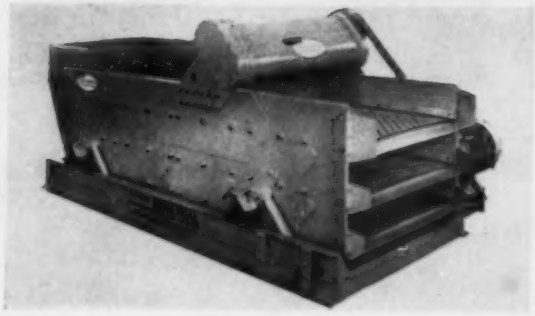

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. . . *in Processing*

Processing equipment is the heart of every producer's plant. Its proper selection and adequate maintenance will eventually make or break him. But manufacturers are so aware of the importance of processing equipment that they offer an almost unlimited selection of standardized and special equipment to do an economical job for almost any aggregates producer. Here's a quick exposure to some of the big and small machinery that find profitable use in the rock products industry.

22—This newly designed paddle washer handles up to 150 tph. of minus 1½-in. coarse aggregates and removes water-soluble deleterious materials. Two 36-in. diam., all-paddle shafts are placed in a 25-ft. long tub, and the 10-in. diam. tubular steel shafts mount cast paddles. The paddle shafts are driven by a 75-hp. motor through a totally-enclosed reducer. *Eagle Iron Works, P.O. Box 934, Des Moines, Iowa*

Enter 262 on Reader Card

23—Fine and coarse materials can be scrubbed together in a new heavy-duty scrubbing drum. Products up to 8 in. can be handled at rates up to 250 tph. Three standard sizes are available. A 6 x 12-ft. unit handles a range of 60 and 120 tph.; the 7 x 14-ft. unit has a capacity between 90 and 180 tph., while the largest in the line is an 8 x 14-ft. drum with a range between 125 and 250 tph. Special sizes and optional features can be supplied to do particular jobs. *McLanahan & Stone Corp., Hollidaysburg, Pa.*

Enter 263 on Reader Card

24—This line of vibbrating screens has one-piece steel plate sides to withstand the punishing conditions of vibrating screen service. The screen cloths are supported on rails capped with neoprene cushions, and the screens can be readily removed and replaced, even on the relatively inaccessible lower decks. Standard screens are offered for aggregate screening from 1½ to 3 ft. through 5 x 16 ft. Optional features that can be added include ball decks, washing sprays, electric heaters, step decks and dust enclosures. *Overstrom & Sons, Inc., 2313 W. Mission Rd., Alhambra, Calif.*

Enter 264 on Reader Card

25—Vibrating screen economy is offered in a new line of two-bearing screens. Manufacturing economy has been achieved with the use of modular parts on a number of different units without impairing the quality or capacity of the new units. The screens can be floor-mounted or suspended, and a universal bracket makes it possible to change the style of mounting as well as the incline of the screen. A number of standard sizes are available ranging from 3 x 6-ft. screens to 6 x 16-ft. screens, with one, two or three decks. *The W. S. Tyler Co., 3615 Superior Ave., Cleveland 14, Ohio*

Enter 265 on Reader Card

26—Three larger sizes of horizontal vibrating screens are now available. The 5 x 12, 5 x 14 and 5 x 16-ft. screens include 2, 2½ or 3 decks. There are no leaf or coil springs in the new screens. Instead, they use air springs and rubber-bushed phasing bars. *Universal Engineering Corp., 625 C Ave. N.W., Cedar Rapids, Iowa*

Enter 266 on Reader Card

A new, low-cost sand and gravel processing plant is available to the producer with modest capacity or who is just getting started in the business. The new plant is ideal for materials that do not need scrubbing. It will produce two sizes of gravel and an oversize and one sand fraction. Capacity is in the range of 70 to 100 tph. Standard equipment includes a reciprocating plate feeder, conveyor, screen with spray bar, a sand screw classifier and two storage bins. Electric motors are used throughout. *Pioneer Engr. Div., Poor & Co., Inc., Minneapolis 14, Minn.*

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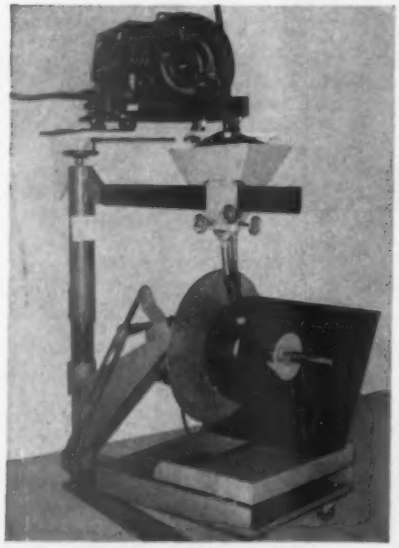
Please turn to page 103

SHOVEL ROLLS
better than new

Shovel roll as rebuilt with Stoody wires.

when rebuilt and hard-faced
with **STOODY ALLOY WIRES**
. . . by either Automatic or Semi-Automatic Welding



Semi-automatic welder with positioner.

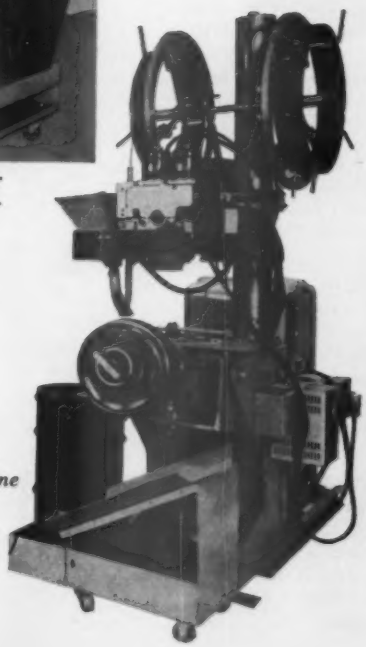
Don't throw worn shovel rolls and similar parts on the scrap heap! Rebuilt and hard-faced with Stoody alloys, such parts are as good or better than new—at a fraction of replacement cost.

Rebuilding is fast... by the semi-automatic or the full automatic welding processes. With the semi-automatic welder a simple positioner is used as shown at the left. The welder is a versatile machine that can be used either with the positioner or manually in the usual way as illustrated below. Investigate the semi-automatic; it does more work in less time, reduces replacements, soon pays for itself.

Your Stoody dealer will be glad to direct you to custom automatic shops or to demonstrate the semi-automatic in your own shop. Run the machine yourself... test it on your own rebuilding and hard-facing jobs.

See the "Yellow Pages" in your phone book for your local Stoody dealer or write for his name and address. Completely illustrated folders on all Stoody wires are available.

STOODY COMPANY
11942 East Slauson Avenue • Whittier, California



Automatic welding machine rebuilding a shovel roll.

Typical manual semi-automatic operation, open arc.

THE NEW LE ROI TRAC-NEWMATIC

puts down big 4 inch hole fast!

Drills at any angle

...on uneven terrain

...straight ahead

...straight down

...or over-the-tracks

DOWN DEEP FOR MODERN DRILLING

Here's Le Roi's brand-new, hard-working crawler drill — The Trac-Newmatic.

The Trac-Newmatic carries a big 5-inch drifter on an extra-sturdy air-powered feed shell . . . all mounted on a hard-lugging crawler that can pull a 600 rotary along with it over tough terrain.

The 5-inch drifter features a striking-bar design that efficiently squeezes every ounce of power out of the available air . . . minimizes leakage and blow-by . . . drills 4-inch hole fast. What's more, the drifter has forward, neutral, and reverse rotation to assure fast driving, easy extracting, and speedy steel-uncoupling or coupling.

An air-motor driven hydraulic pump is used to quickly position the feed shell for breast- or lift-hole drilling either straight ahead or over the tracks to give a wide drilling pattern from a single location. A standard model with hand-operated hydraulic pump to raise and lower the boom is also available.

Tramming is easy, too . . . two hefty 7½ hp reversible air motors give the Trac-Newmatic plenty of power, while the oscillating tracks permit tramming or parking even on irregular terrain. Controls are mounted for both convenient operation and good visibility, and a "deadman" feature anchors the unit in place when the tramming levers are released.

See the Trac-Newmatics at your Le Roi distributor—or write us for more detailed information. Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wis.

LE ROI NEWMATIC® AIR TOOLS

AT-913

PORTABLE AND TRACTAIR® COMPRESSORS • STATIONARY COMPRESSORS • AIR TOOLS

TOOL UP FOR EFFICIENCY . . . IN PROCESSING

continued from page 100

27

27—Sticky, clayey aggregates can be screened efficiently with a newly developed rod-deck screen. The loose rods can be incorporated into existing screens to improve their screening efficiency. The rods are held in place with heat-treated steel spacer bars, and the rods rotate freely. Replacement is possible, either singly or in sections. Installed across the flow of material, the rotation of the rods tends to prevent any buildup of material. Secondary vibration of the loose rods produces a finer separation than has been possible when handling difficult materials. *Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.*

Enter 268 on Reader Card

28

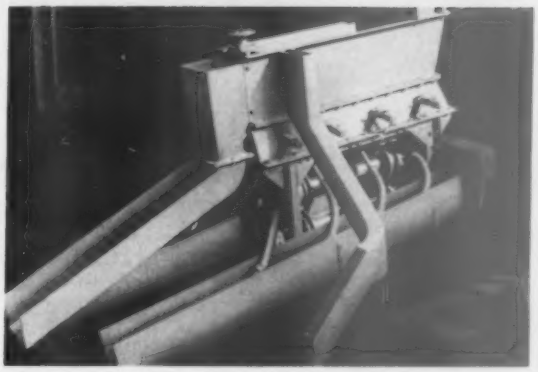
28—A recently introduced slotted wire screen offers greater accuracy and improved capacity when handling fine materials. The screen wires can be made in a number of profiles including tapered, slanting, diamond and flanged. They can be fabricated in carbon, stainless steel or other metals, with clear openings down to .002 in. wide. Since the individual wires are relatively narrow in relation to their depth, more wires and a larger clear opening per inch of width is possible. Formed spacer lugs on each wire maintains the spacing of the long slots and prevents lateral deflection of the wires. *Cross Perforated Metals, National Standard Co., Carbondale, Pennsylvania*

Enter 269 on Reader Card

29

29—Continuous, accurate weighing is often an important part of the processing in any aggregates producer's plant. An electronic weighing device generates information that is essential in controlling subsequent processes. The machine can monitor the incoming feed, make a permanent record on tickets or tape, and a digital logger is an optional feature. *Merrick Scale Mfg. Co., Passaic, N.J.*

Enter 270 on Reader Card



30

30—This pilot-size jig has all the characteristics of the larger units in the line and it may be used as an experimental unit or as a small-capacity production machine. It combines the speed and length of the conventional jig stroke with high-frequency pulsation to create uniform jigging action. Only 1 x 3 ft., this is the smallest unit in a line that goes up to 5 x 16 ft. *WEMCO Div., Western Machinery Co., 650 Fifth St., San Francisco 7, Calif.*

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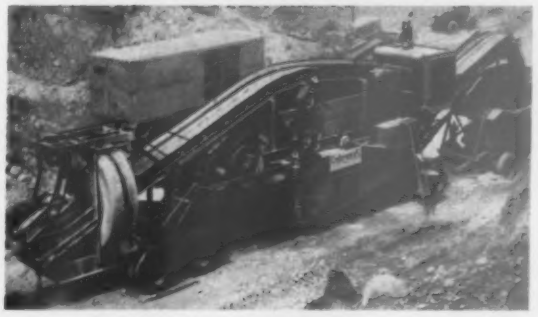


31

31—Capacities up to 500 tph. are attainable with a new portable crushing and screening plant. While it is completely portable, it includes heavy-duty components. A 12 x 36-in. twin jaw crusher is teamed with a 4 x 14-ft., three-deck vibrating screen, and other components have been designed to match. A number of optional features increase the usefulness of the unit. Prescreening attachments, a spray bar, screw conveyors and other equipment can be added. *Iowa Mfg. Co., Cedar Rapids, Iowa*

Enter 272 on Reader Card

32—This portable crushing and screening unit combines large capacity with low weight. Traveling weight is about 55,000 lb. Capacity is about 175 cu. yd. an hour with about 25 percent oversize. Component parts include a 10 x 36-in. jaw crusher, a 32 x 24-in. roll crusher and a 4 x 12-ft. vibrating screen with 2½ decks. *Diamond Iron Works Div., Goodman Mfg. Co., Chicago 9, Ill.*

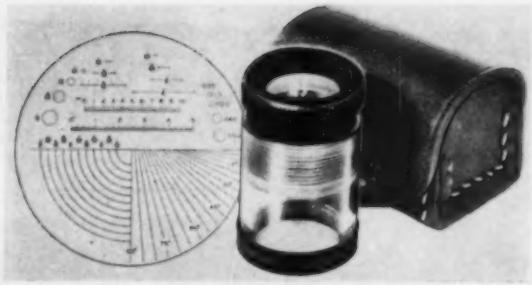
Enter 273 on Reader Card

32

A giant hammermill has been designed especially for the requirements of the aggregates industry. With a 50-in. feed opening and a 40-in. hammer arc, it is the largest unit in the manufacturer's line. A large volume of cubic material with a minimum of slabs or slivers makes it ideal for aggregate production. For production of crushed limestone, three hammers are standard. But for hard or abrasive rock the unit can be changed to two rows and the grates can be removed. *Iowa Mfg. Co., Cedar Rapids, Iowa*

Enter 274 on Reader Card

Please turn page



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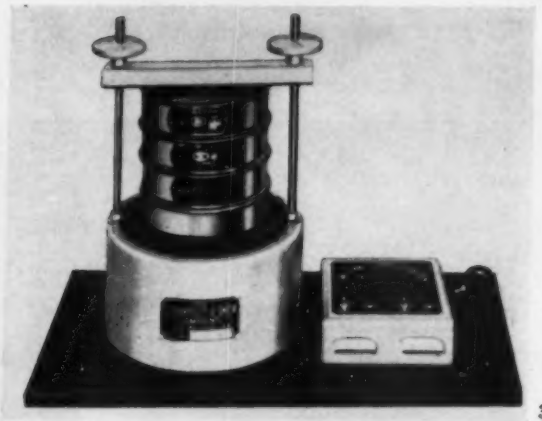

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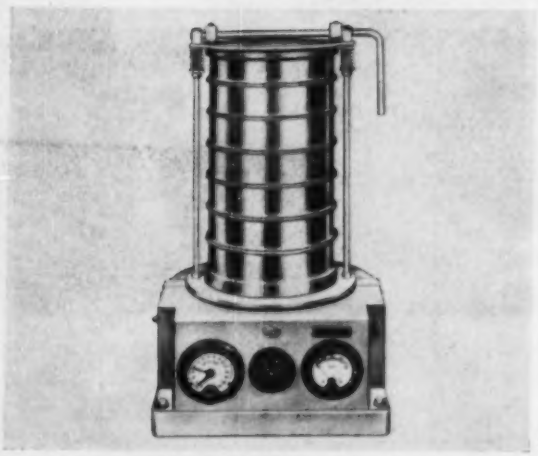

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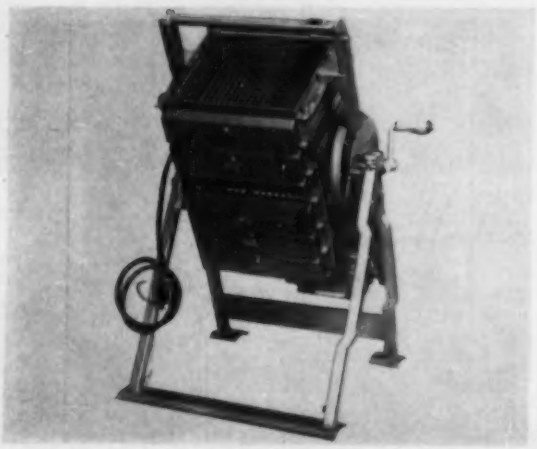


36

TOOL UP FOR EFFICIENCY

continued from page 103

. . . *in Testing*

Practically every specification for aggregates has particle size as a basic measurement. In addition, particle size distribution is becoming more important as the influence of distribution is better understood in the design of both bituminous concrete and portland cement concrete.

Therefore, it becomes essential for every rock products producer to be able to make quick, accurate measurement of every specification in his production right at his own plant. This he cannot do without adequate testing equipment. With these tools he is then in a position to keep control of his day-to-day production within the limits of the specifications. With more skill in operating his testing equipment, the knowledgeable producer will be able to maintain a uniform product.

Here are a number of new or recently developed innovations in laboratory tools for analyzing particle size in aggregates. In addition, here is a new technique for making bulk density tests on aggregates. Finally, we looked deep into our crystal ball to speculate on the role of nuclear energy in the future of the rock products industry.

33—It's easy to measure and classify sand samples right on the spot with a pocket-size instrument. This new compact comparator is offered with a sand-measuring reticle with an easily-focused 6-power magnifying glass. The 2 x 2¼-in. instrument with its carrying case is always available for immediate use. *Edmund Scientific Co., Barrington, N.J.*

Enter 275 on Reader Card

34—This laboratory testing screen is said to be ideal for screening dry granular or powdery materials even through the 200, 325 and 400-mesh sieves. Apparently, there is no blinding of the screens when operated with slurries or other suspensions. This screening efficiency is achieved with an unusual vertical-horizontal pulsating action that is provided by two independently driven shafts. The motor on each shaft can be independently controlled. Three sizes are available to meet almost every producer's testing requirements—8, 12 and 18-in. diam. *The C. O. Bartlett & Snow Co., 6200 Harvard Ave., Cleveland 5, Ohio*

Enter 276 on Reader Card

35—An improved timing device improves the efficiency and usefulness of this 8-in. diam. laboratory testing screen. A push-button control assures that successive batches of material are screened in exactly the same length of time—eliminating the human factor in setting the timer. An electromagnetic drive produces 3,600 vibrations a minute to achieve fast, highly accurate separations of granular materials. A control rheostat on the drive brings the voltage to 90 v. regardless of variations in line voltage. This assures the uniformity of each test. *Syntron Co., Homer City, Pa.*

Enter 277 on Reader Card

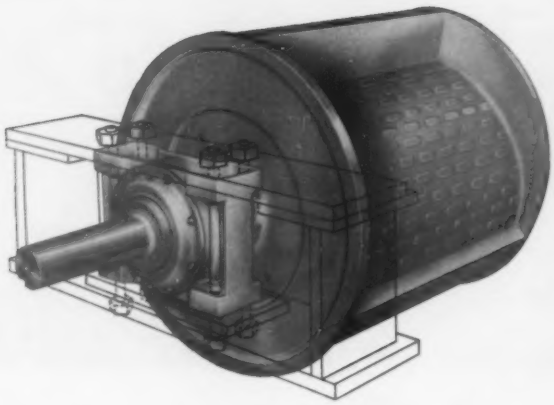
36—This manually operated, portable testing screen can be moved right up to the pile of aggregates to be tested. The unit can handle large samples—up to about 25 lb. of crushed stone or sand and gravel. Six compartments hold removable screen sections that are imbedded in resilient plastic edging. These sections are available from 1½-in. sq. clear openings down to 200-mesh cloth, and the plastic holds the ends of the wires in place to assure screening accuracy in every part of the section. The testing screen assembly can be broken down into two easy-to-carry sections and is easily operated by hand. However, where power is readily available, the unit can be driven by a small electric motor and V-belt drive. *Gilson Screen Co., 110 Center, Malinta, Ohio*

Enter 278 on Reader Card

Please turn to page 111

HIGH REDUCTION RATIOS with HIGH CAPACITY

KENNEDY DUAL-ROTOR IMPACT BREAKERS



This is the exclusive KENNEDY solid rotor of armor plate steel machined to perfect balance. Its entire face is hard surfaced. Manganese steel end discs prevent side wear and confine process material to the reduction area. A heat treated, alloy steel shaft is pressed and locked into the rotor core. Heavy duty, self-aligning, spherical roller bearings are rigidly attached to the heavy, box section base frame.

KENNEDY Impact Breakers are characterized by high capacities, high reduction ratios and a high proportion of cubical product at relatively modest initial and operating costs. Five convenient sizes are now available, from 30 x 48 to 60 x 72. These, plus the 36 x 30 single-rotor model, make up a line of machines with a size for every application.

KENNEDY Impact Breakers feature:

- primary and secondary reduction in one operation . . . because of their higher capacity, fewer machines are required.
- use of the principle of true, controlled, free impact . . . rock is shattered along the lines of natural cleavage.
- simple, inexpensive maintenance . . . truly effective use of wearing parts keeps output and product quality high.

Send for KENNEDY Bulletin 60-A describing the many features of KENNEDY's Dual-Rotor Impact Breakers, the most efficient and effective impact breakers built.

KENNEDY VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

405 PARK AVENUE, NEW YORK 22, N.Y. • FACTORY: DANVILLE, PA.

Primary & Secondary Gyratory Crushers • Jaw Crushers • Roll Crushers • Impact Breakers • Hammer Mills • Rod & Ball Mills • Kilns & Kiln Accessories • Dryers • Scrubbers • Screens • Pneumatic & Mechanical Conveyors • Complete Crushing, Lime, Cement & Carbon Paste Plants. • Research & Testing Service.

Enter 1313 on Reader Card

sinkers

CP-69 Sinker Drill. This new, fast drilling, heavy-duty 55-pound class Sinker has "Beavertail" retainer for extra durability. All-purpose backhead permits Blower Dry, Wet and Air-Water operation. Air consumption and maintenance are low.

airlegs

Attachable or Integral Airleg Mountings set up fast! Give high drilling efficiency with hard-hitting CP Sinkers and tungsten-carbide bits. Closely held feed pressures insure full bit contact for maximum footage. Single or double telescopic feed available.

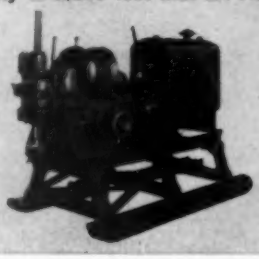
demos

The streamlined CP-124 Demo is the newest in a great line of smooth-handling demolition tools. Has shock-proof latch-type retainer and 4-bolt backhead. This all-new 80-lb. class demo packs more smashing power per pound than any other demo on the market.

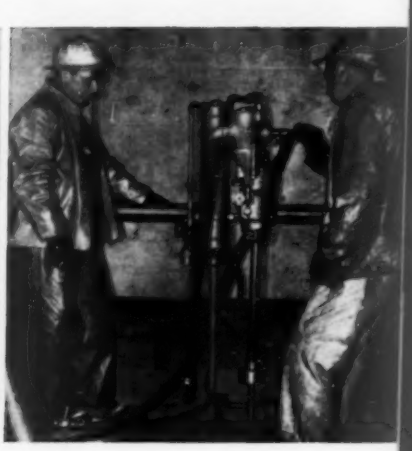
core drills

CP post-mounted Core Drills cut costs for: blastholing, foundation sampling, grout-holing, weep holes. The new CP-65 Diamond Drill — world's fastest — delivers 20% more power than its predecessor, the world-famous CP-55. Capacity: 600 feet with EX Fittings.

Versatile skid-mounted Core Drills may also be truck mounted. Gasoline, diesel, air or electric drive. Capacity to 2,250 feet with EX Fittings.



Skid-mounted Core Drill



wherever there's a ROCK PROBLEM there's a CP ROCK DRILL TO LICK IT!

Enter 1308 on Reader Card

Tracdrils

All-new G-900 Tracdril for 4" and 4½" Deep-Hole Drills The only rig that can drill at right angles to tracks on either side . . . a full 180° swing. Drills extra-low snake holes or hard, high horizontals 11 feet overhead. Extra long tracks and knee action increase pulling power and stability. Automatic brakes and "dead man" tramming controls insure operator safety. Dual operating controls at boom end and turret save steps, increase throttle time.

REICHdrills

All-hydraulic top-drive rotaries can be truck, crawler or tractor mounted. Every feature is designed for easy, one-man operation . . . simplicity of controls . . . absolute control of rotary speed and feed pressures . . . quick moves . . . easy set-ups. Hole sizes to 16"; down pressures to 90,000 lbs. You get more from your rotary when it's a REICHdrill.

You'll find project-proved CP ROCK DRILLS setting footage records in every kind of formation. For EXPLORATION to see what you're up against . . . for BLAST HOLE DRILLING under every conceivable condition . . . for SECONDARY BREAKING or DEMOLITION – your quickest way to lick the problem is to start with the right equipment and the *right equipment* is CP.

To get up-to-date information on any specific Rock Drill shown here, write for the latest bulletin to: *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*

Chicago Pneumatic *8 East 44th Street, New York 17, N. Y.*

AIR COMPRESSORS • PNEUMATIC AND ELECTRIC TOOLS • AIR-BLAST BITS • DIAMOND DRILLS • REICHdrills • ROCK DRILLS

Enter 1308 on Reader Card

Where there's Model 100

DUMPTOR SPEEDS NARROW ROAD CUT —George Brewster & Sons, Inc., use DUMPTORS to haul rock for construction of approach ramps to lower level of George Washington Bridge. In places cut is so narrow it prohibits turn-around operations — no problem for dual-controlled DUMPTOR.

DUMPTOR CUTS HAUL TIME IN HALF — Matched against another leading rear dump unit, DUMPTOR recently shaved haul time in half for one operator. Job involved a 603-ft. one-way haul, 204 feet was down a 20% grade. Average trip time: 1 minute, 38 seconds.

MINING ABOVE GROUND AND BELOW — Cramped-quarter underground work, and long steep hauls above prove no problem for DUMPTORS in Canadian copper mine.

no room or time to turn DUMPTOR® outhauls all others

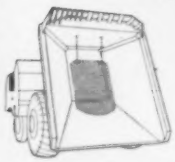
HAULING DOLOMITE IN AFRICA — This DUMPTOR is at work in a quarry near Johannesburg. Job requires a 600-yard haul. Haul time is 2 minutes, 2 seconds. Dump and return time: 1 minute, 52 seconds. DUMPTOR averaged 120 cu. yds. every 50 minutes.

SAND AND GRAVEL SHUTTLE — DUMPTOR is popular in sand and gravel pits, too. Makes quick work of hauling from loader to crusher and screens . . . no need to turn.

• More trips per shift

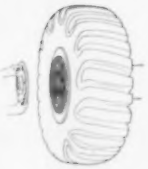
Pivoting seat, dual controls for fast, no turn operation. Travels up to 24 mph in either direction. Ideal for working narrow cuts, on grades, and making the most of time on straightaways.

• Bigger payloads



Carries up to 30,000 lbs. Big 10′ x 10′ square body designed to self-center material — assure full heaped loads every trip. Instantaneous or controlled gravity dump.

• Lower maintenance



Planetary drive axles. Shafts, gears, and differential carrier assembly can be serviced without removing wheels or tires. Oscillating steering axle keeps twists and strains of road travel away from main frame. Dump body is heavily reinforced.

GET ALL THE FACTS — see your Koehring distributor soon. Ask him about the Model 60, too! An 8-ton hauler that delivers the same timesaving features as the 15-ton Model 100. K15

See your distributor about the 1960
KOEHRING EQUIPMENT SHOW
Waukesha, Wisconsin, week of September 19th

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

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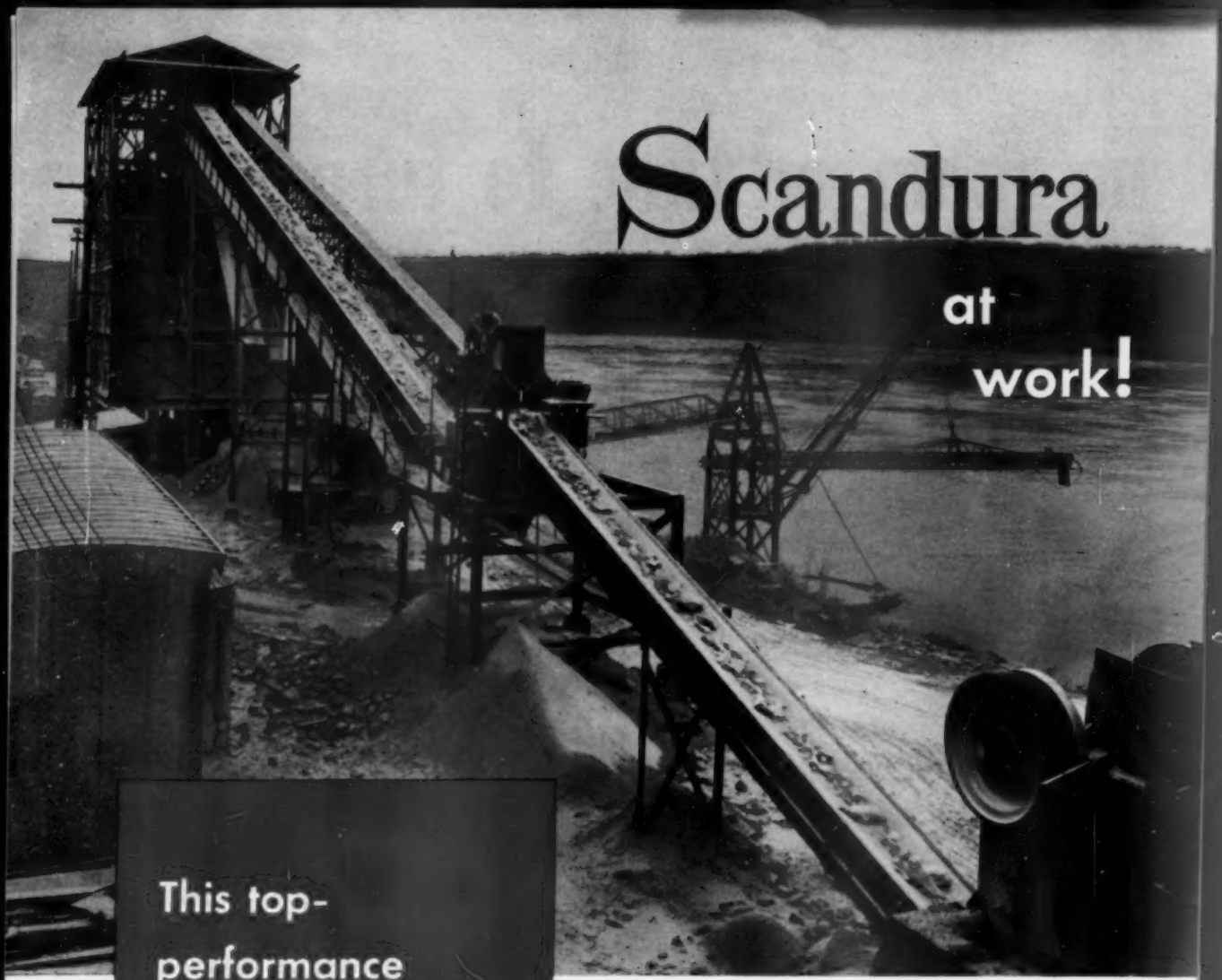

Scandura at work!

This top-performance conveyor belting does a standout job in hauling deep-mined Kentucky limestone crushed to 8" size

These Scandura Gold Line Belts on the operation of a Kentucky producer are delivering typical Scandura performance under rough operating conditions.

The belt in the foreground runs under a primary jaw crusher, receiving the 8" sized limestone under a drop of approximately 3 feet. The severe impact and abrasive conditions point up the tremendous wear qualities of Scandura Gold Line Belting. Solid woven carcass plus a cushioned cover of tough PVC make a waterproof, fireproof, strip and gouge proof belt that is made to order for the most severe rock products service.

Check us on your requirements, and install a trial length of Scandura Gold Line in your conveyor system. *The performance you can measure is performance that sells!*

Manufactured by

Scandura INC.

NORTH TRYON STREET AT KESWICK AVENUE • (P. O. BOX 949) • CHARLOTTE 1, NORTH CAROLINA

TOOL UP FOR EFFICIENCY

continued from page 104

. . . *in Weighing*

Many of the benefits of production efficiency can be dissipated with inefficient weighing and scaling equipment. For it is here at the scalehouse that the actual revenue from production first appears. But if there is a bottleneck at this point and shipping is delayed, the volume of material shipped can be reduced. Efficiency-minded aggregate producers would do well to take another, close look at their shipping methods and equipment. Manufacturers have not overlooked this part of the rock products industry. Here's a sample of their newest offerings.

37

37—Scaled weights can be recorded on either tape or tickets. In addition, a wide range of other identification or accounting information may be recorded on the same document. This will include time and date, load or material identification, serial numbering and counting. Information recorded may be put on tapes of several designs as well as on a wide range of tickets or duplicating forms. The recording device can be enclosed in dust and moisture-resistant housing for the severe conditions in aggregates producers' plants. Electrical operation is standard, but manual operation can be supplied for locations without electrical power. *The Howe Scale Co., Rutland, Vermont*

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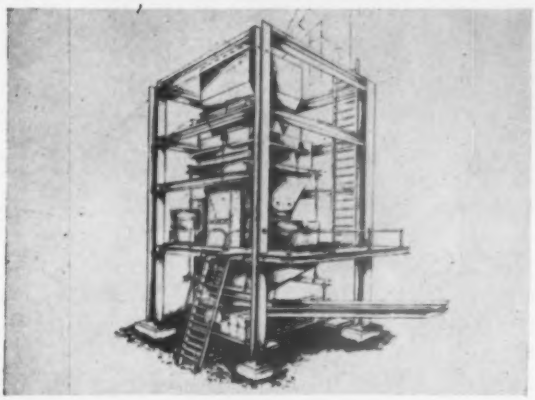

38

38—An automatic bulk materials weighing system offers accuracy within 1/10 of 1 percent in the range between 100 and 600 tph. Heart of the system is an automatic hopper scale. The weighing hopper itself is divided into two sections—a dribble reserve compartment and the main weighing compartment. The system allows for any overfeeding and for any material adhering to the walls of the weighing hopper. Complete interlocks are provided as are fail-safe features in the event of power failure. *Richardson Scale Co., Clifton, N.J.*

Enter 280 on Reader Card

39

39—Aggregates can be loaded into trucks at 12 tpm. with a new portable scale-loader. The complete unit weighs 15 tons. It is mounted on its own trailer and can be transported to a job site at 50 mph. A three-man crew can put it into action in less than an hour. Weighing accuracy is maintained with an electronic load cell. Guaranteed accuracy is within ½ of 1 percent. For batches of various weights, weighing is controlled by an operator through a control console. A duplicate printed record is made of each batch to eliminate the human element in observing weights and transcribing figures. *Western Conveyor Co., Boise, Idaho*

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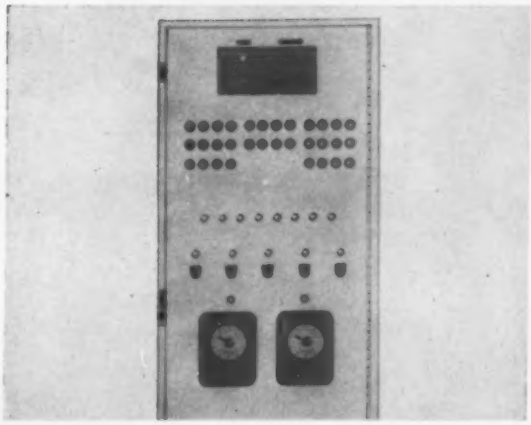

40

40—A bonded strain gauge load cell is the heart of a weighing and batching system that offers high accuracy. It permits remote controlled indicating and recording. There are no moving parts to hamper operation in dusty locations. The system permits either manual control or automatic sequence batching. *Gilmore Industries, Inc., 13015 Woodland Ave., Cleveland 20, Ohio*

Enter 282 on Reader Card

The calibration of electronic load cells is made easy without using test weights, when the circuits are installed with this manufacturer's scales. Once set, the system operates at the flick of a switch to verify if the scale is still completely accurate. *Toledo Scale Corp., Toledo 12, Ohio*

Enter 283 on Reader Card

Portable truck scales are available up to capacities of 100 tons. The new, all-steel units have platforms up to 80 ft. long and 14 ft. wide to accommodate the largest off-highway haulage rigs. Using inexpensive timber supports, a simple concrete slab or concrete beams, the weighing unit can be readily transported from one location to another and be set up in a matter of minutes. *Cardinal Scale Mfg. Co., P.O. Box 151, Webb City, Mo.*

Enter 284 on Reader Card

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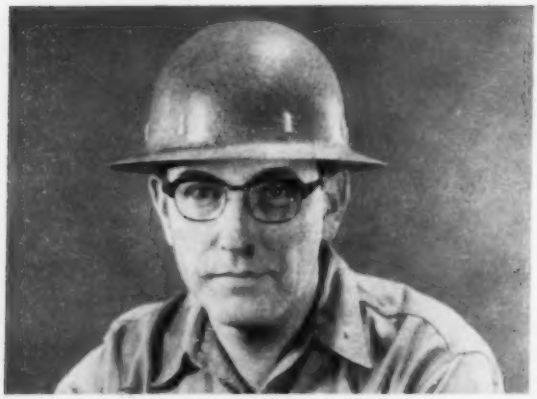

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TOOL UP FOR EFFICIENCY

continued from page 111

. . . *in Safety*

Almost every aggregates producer realizes that his employes are probably his most important asset. Yet there seems to be a widespread lack of enthusiasm among producers and employes for personal safety. The National Crushed Stone Association reported that one-third of all accidents in 1958 and 1959 were injuries to head and feet. Further, in 1959 there was a 50-percent jump in these injuries over the number in 1958. Hard hats, safety glasses and safety shoes are relatively inexpensive and easy to get. With the extensive use of this kind of protection, head and foot injuries can be prevented. Here are some ideas for personal protection for your consideration.

41—Hard hats come in many colors and types. Fiberglas hats are offered in white, red, blue, brown, gray, green and yellow. Aluminum hats are in a natural, anodized finish. High-dielectric hats for electrical maintenance men are offered only in yellow to make sure that no one picks up the wrong hat before working on electrical equipment. The new headgear is supposed to be as comfortable as a soft hat with the additional advantage of adjustment to fit. Full linings are available for winter wear, and sweat bands can be removed for summer comfort. *Bausch & Lomb Optical Co., Rochester 2, New York*

Enter 285 on Reader Card

42—The entire respirator is a filtering area in a new, lightweight urethane filter. The all-plastic mask is a single piece of foam that is said to more than double the filtering area over more conventional masks. The 1-oz. mask fits snugly and comfortably. It can be washed repeatedly and reused with no loss in efficiency. Nor does it absorb odors, mildew or deteriorate. *Watchemoket Optical Co., Inc., 232 W. Exchange St., Providence 3, Rhode Island*

Enter 286 on Reader Card

43—Where windblown dust and fine material is a hazard to the comfort and safety of workers, this safety face shield may prove to be a most useful piece of equipment. It gives workers both visibility and face protection. An optically correct acetate window is secured to a 24-mesh metal screen, with the window available in clear, tinted green or aluminized plastic. The shield is held securely in front of the face with an adjustable headband to let the worker wear his regular glasses or goggles. A selection of headbands is available, including a special shield for electrical workers. *American Optical Co., Southbridge, Mass.*

Enter 287 on Reader Card

44—A personalized air-conditioning system gives the worker the ultimate in comfort and safety while working in particularly hot and dusty locations. The equipment looks more like a space helmet than the efficient, useful safety tool that it is. An electrically powered refrigeration system pumps cooled, filtered air through a plastic hose to an insulated helmet. The welded-steel-jacketed, highly portable air conditioning system is a self-contained unit that can be mounted on any convenient base. It operates on either 6 or 12 v. automotive electrical systems and can be supplied for conventional ac. current. A heater is available for winter operation. *Jamieson Laboratories, Inc., 7900 Haskell Ave., Van Nuys, Calif.*

Enter 288 on Reader Card

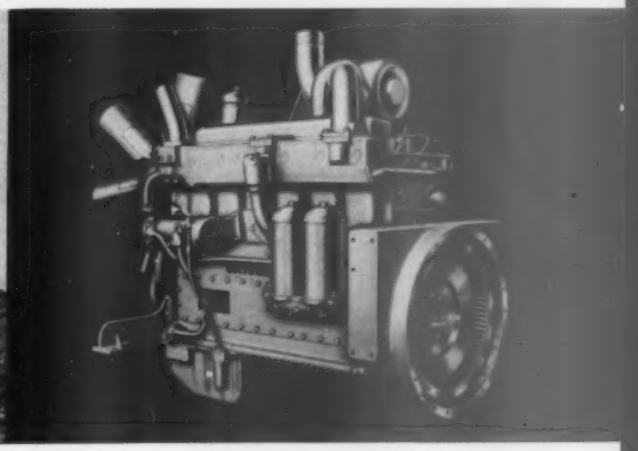
A British firm has developed an ingenious method for "dedusting" workers that might be useful in many aggregates plants. It is an efficient way of removing dust from clothing, and overcomes the hazards of the indiscriminate use of compressed air. The machine is simply a large telephone booth. When the door is closed, jets of compressed air disturb the dust in the worker's clothing. Before the dust can settle again, fans pull out the dusty air. *John Bass Limited, Crawley, Sussex, England*

Enter 289 on Reader Card

Please turn to page 114

NEW CAT NO. 14 SERIES C MOTOR GRADER

Compact engine plus many other refinements assure top performance, easier servicing, long life



Important changes make up the new Series C No. 14 Motor Grader—big improvements throughout to give you better performance, long life and servicing ease:

NEW COMPACT 150 HP ENGINE The short, rigid block and stress-relieved crankshaft give greater strength and shock resistance. New cylinder head design resists distortion yet has superior cooling characteristics. Large water pump with cast-iron impeller, ceramic seal face, and carbon type seal combined with a 20 per cent increase in radiator capacity improves cooling, lengthens life.

NEW STARTING ENGINE All-weather starting with this new two-cylinder vertical gasoline engine is assured. Replacing the horizontal engine, this design features aluminum pistons and overhead valves for improved performance. Bore is 2.38″, stroke is 2.38″, and compression ratio is 8:1. Over-running clutch in starter pinion prevents damage to starter engine when diesel starts, a year-round starting plus.

NEW SERVICING EASE An advanced fuel system is designed for easier servicing and more efficient operation. Compact fuel injection pumps with barrel and plunger assemblies enclosed in housing help reduce wear, lengthen service life.

Plus all the features that made the No. 14B the most versatile motor grader in the "big machine" field . . .

EXCLUSIVE OIL CLUTCH—provides up to 2000 hours of service without adjustment, equal to about a year of "adjustment-free" operation.

DRY-TYPE AIR CLEANER—removes 99.8 per cent of all dirt from intake air. Can be serviced in five minutes.

MECHANICAL CONTROLS—provide easy engagement. "Anti-creep" lock makes blade stay put under load.

FULL VISIBILITY—operator has unobstructed view of job even while seated.

Now, all Cat Motor Graders feature the compact engine. Like the new No. 14C, the 85 HP No. 112E, the 100 HP No. 112F, and the 115 HP No. 12E are all designed to give you the highest production at the lowest possible cost. Your Caterpillar Dealer can give you the facts and figures. He can prove it both on paper and on your job. Call him today.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

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THE NEW NO. 14C MOTOR GRADER— MADE FOR THE BIG JOBS

TOOL UP FOR EFFICIENCY

continued from page 112

. . . *in Prospecting*

As long as sand and gravel deposits were easy to find, and rock ledges were open to public view, there was very little interest in prospecting tools. But now we have reached a point where aggregates are uncommonly hard to find and we must begin to use the knowledge of the geologist and to search in the most unlikely places. The use of prospecting tools alone does not guarantee success. But teamed with geologic common sense, these recent developments can help a producer extend his reserves. Of course, we couldn't show all the possible new gadgets dealing with seismic analysis, core drilling or material sampling—just a few samples to show what's available.

45

45—Seismic analysis with a portable refraction seismograph makes it possible for a rock products producer to study the subsurface down to about 100 ft. Properly set up and interpreted, the instrument can determine the depth and density of overburden, rock formations, clay strata and possible sand and gravel deposits. Very often the clues provided by seismic analysis point out the existence of hidden deposits and/or suggest promising areas to prospect with core drills. The only equipment needed is the refraction seismograph itself, a geophone receiver, a steel plate, a coil of wire and a sledge hammer. *Caterpillar Tractor Co., Peoria, Ill.*

Enter 290 on Reader Card

46

46—Aggregate producers can do their own prospecting with a newly developed portable instrument. Two men can operate the 16-lb. machine to obtain accurate subsurface information on any terrain. Seismic impulses are produced with a sledge hammer, and the reflected sound waves are registered and measured by the electronic circuits in the machine. Readings indicate the depth and type of material and the existence or absence of bedrock. With readings normally made 200 ft. apart, prospecting can often cover ¾ mi. a day. *Geophysical Specialties Co., 15409 Robinwood Dr., Hopkins, Minn.*

Enter 291 on Reader Card

47

48

47—A newly developed core drill can drill holes up to 14 in. diam. and provide plenty of down-feed pressure when drilling the maximum diameter hole. Core holes can be drilled on any surface at any angle. The drill head can be rotated a full 360 deg. on a sturdy 3-in. diam. steel column. The motor itself operates at a relatively low speed and has plenty of built-in protection against overload and improper voltage. Three models are available: the DH 20, for holes from ½ to 2 in. diam.; the D 20, for 2 to 6½ in. diam., and the D 30, for up to 14 in. diam. The smallest unit can be converted to a hand-held drill. *Clipper Mfg. Co., 2800 Warwick, Kansas City 8, Mo.*

Enter 292 on Reader Card

48—This core drill can be anchored to smooth or irregular surfaces with three vacuum suction pads. A flick of a switch assures safe, secure mounting. Since normal vibration is adsorbed by the vacuum pads, bits last longer and the machine drills straight holes more rapidly. Penetration of 1 to 4 in. per min. is possible. The 150-lb. machine can be set up by one man in a minute. Thin-wall diamond bits are offered for cores from ¼ to 4 in. diam. *Diamond Core & Saw Div., Portomag, Inc., 1521 E. 9 Mile Rd., Ferndale 20, Mich.*

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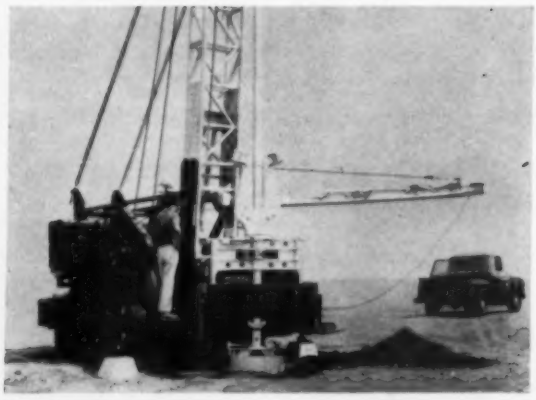

49

49—Prospecting and sampling is made easier with a rotating bucket drill on a self-propelled crawler unit. Standard rigs are offered with gasoline engines, but diesel engines are available. Ample power is provided to drill in almost any granular formation—to make holes up to 200 ft. deep from 12 to 120 in. diam. A kelley bar crowd puts plenty of pressure on the drill to penetrate dense formations, while a hydraulic dumping arm permits fast dumping of the sample from the bucket. *Calweld, Inc., 7222 E. Slauson Ave., Los Angeles 22, California*

Enter 294 on Reader Card

Please turn to page 118

MANITOWOC 4500 VICON®

the only *really new* excavator design since steam!

This big 7-yd. VICON dragline removes 5,500 yards of shale and sandrock overburden every 10-hr. shift. Making 40-ft. deep cuts, the 4500 VICON is equipped with a 100-ft. boom.

The Manitowoc Model 4500 VICON represents the most outstanding advancement of excavator design in decades. Here is a 6 yard shovel or 7 yard dragline incorporating new, tested design principles to give you more yardage in less time than any other mechanical or electrically driven shovel-drag in this size range. Thoroughly proved on the job for over three years, VICON design has increased yardage 25% or better, substantially reduced maintenance costs, and piled up more profits for owners. Some exclusive VICON features are:

INTEGRATED CONTROLS that serve both as clutch operating levers and as engine throttles, providing variable speed control over each function. Clutches, being responsive to lower range of control pressures, are engaged before engines are accelerated. Slippage and overheated friction surfaces are eliminated, lengthening clutch life appreciably.

HOIST AND DRAG DRUMS ARE INTERLOCKED to automatically synchronize their operation. Cycle time is faster and output is greater because full horsepower is always available for hoist—the operator doesn't "soak" it up with the drag brakes. Operating costs are noticeably less because brake use is cut by 50% and lining wear is drastically reduced. Another advantage of the VICON interlocked drum arrangement is that the operator can "power lower" or free-cast the bucket.

DUAL INDEPENDENT ENGINE POWER with one engine powering the main drums, and the second all other functions. Here are all the advantages of electric or conventional diesel engine mechanical drive without the disadvantages of each. You get the performance characteristics of electric drive — smoother power flow, variable independent speed control, simultaneous operation of dig, hoist, swing, and propel functions—without sacrificing mobility, without incurring the headaches and special maintenance problems of electric drive, without needing a separate power source at every job site. You get the simplicity of mechanical drive without losing valuable production time because of engine "lug down", without needing to jam clutches into engagement at high and harmful engine speeds, without the limitations of operating speeds that are inherent in conventional diesel engine drive.

Why not get the complete story on the *sensational* Model 4500 VICON today? Your nearby Manitowoc distributor has all the facts.

MANITOWOC

8-A1 *Variable Independent Control

Manitowoc

MANITOWOC ENGINEERING CORP.

(A subsidiary of The Manitowoc Company, Inc.)

Manitowoc, Wisconsin

SHOVELS	CRANES	DRAGLINES	TRENCH HOES
1¼ — 6 YDS.	25 — 125 TONS	1¼ — 7 YDS.	1¼ — 3 YDS.

Enter 1312 on Reader Card

ONLY LOADER WITH 5-WAY

Allis-Chalmers tractor loaders offer extended service life, far less down-time by thoroughly cleaning all air and filtering all hydraulic oil.

Unmatched filtering protection—that's what you get in all Allis-Chalmers tractor loader models.

Air is double filtered by:

1. air breather
2. air filter

Hydraulic oil is cleaned by:

3. full-flow micronic filter
4. conical screen
5. magnetic filter

This 5-way filtering protection brings peak hydraulic operating efficiency . . . extended service life.

move ahead with

HYDRAULIC PROTECTION

Complete filtering protection is just another way Allis-Chalmers tractor loaders set the pace in the loader field. They also feature: *pin-connected axles* that eliminate shifting and rolling under load; *exclusive single-lever control* of all speed and direction; *safe, well-located dump cylinders* that are up and away from dirt; *extra reach* for easier dumping and *added stability* for moving big loads without tipping or spilling.

Your Allis-Chalmers dealer can give you facts on all 5 tractor loader models—ranging in capacity from 1 to 5 cu yd, in power from 76.5 to 130 horsepower. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

... power for a growing world

TOOL UP FOR EFFICIENCY

continued from page 114

50

. . . *in Communications*

Short wave radio and closed circuit television have become powerful new tools for the cost-conscious aggregates producer. Radio was probably first used extensively on delivery trucks but is now doing important jobs around the processing plant. Personal radios are the most recent development. It is now possible to equip every supervisor or foreman with his own small, lightweight receiver so that he can be issued instructions on the spot. Television is so new to the aggregates business that its value cannot be assessed yet. But in spite of its relatively high cost, producers are putting in TV above crushers, over delivery chutes and in remote tunnels—anywhere that trouble might prove to be disastrous if undetected for very long.

50—A 12-oz., all-transistor radio fits easily into a pocket, and its miniature speaker clips to the wearer's lapel. The powerful new receiver keeps its owner in constant contact with a base station transmitter, a two-way car radio or any portable transmitter on the same frequency. Power drain on the 6½-v. battery is only 58½ milliwatts when receiving a message. A loop stick ferrite antenna built into the case eliminates an external antenna. Adjustable controls are flush mounted on the case. Initially, the radio will receive messages on the 150 to 174-mc. band. *General Electric Co., Lynchburg, Va.*

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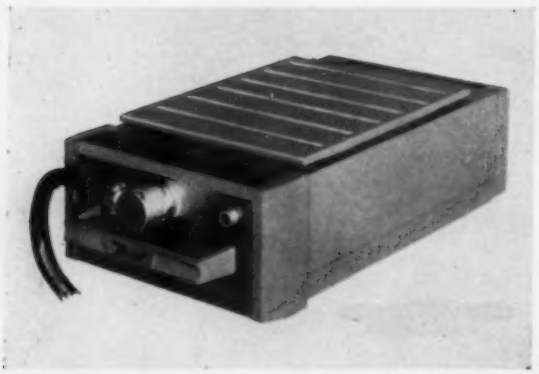

51

51—A high-performance two-way radio has been designed for the heavy-duty applications in the rock products industry. It features extensive use of transistors and printed circuits and uses only two tubes in the receiver for sensitivity. This is the first unit in the manufacturer's line to use standardized connectors. Dual-channel operation is standard, with four channels available as optional equipment. *Bendix Radio Div., Baltimore 4, Maryland*

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52

52—A new line of compact, reliable two-way radios is offered in either 25 or 50-watt models for the 25 to 54-mc., low-band frequencies. Another group of 30, 60 and 80-watt models is available for the 144 to 174-mc. band frequencies. Reliability is achieved by the extensive use of transistors in both sending and receiving sets. The chassis are die cast for ruggedness. At the same time, the castings act to dissipate heat from the few tubes and power transistors. The entire unit is completely sealed to protect components and circuits from dust and moisture. *Motorola Inc., 4501 W. Augusta Blvd., Chicago 51, Ill.*

Enter 297 on Reader Card

53

53—Weather, shock, vibration and noise will not impair the effectiveness of this newly developed industrial television camera. The 7-in. diam. by 16-in. long camera weighs only 16 lb. It needs no additional housing to perform satisfactorily under the most severe conditions. Power requirement is only 15 watts and operates on 115-v. ac. with 50, 60 or 400-cycle current. The system is completely transistorized and uses printed circuit modules for each separate function of the camera. Camera and controls can operate up to 2,000 ft. apart. *Dage Television Div., Thompson Ramo Wooldridge Inc., Michigan City, Indiana*

Enter 298 on Reader Card

A rugged, dust-tight television camera is offered for the severe service of the rock products industry. It will work efficiently at low light levels down to 1 ft.-candle and requires only 18 w. of power. The self-contained camera is completely transistorized. The 9-lb. unit is 5½ in. diam. and 11¾ in. long to provide exceptional mobility. *General Electric Co., Lynchburg, Virginia*

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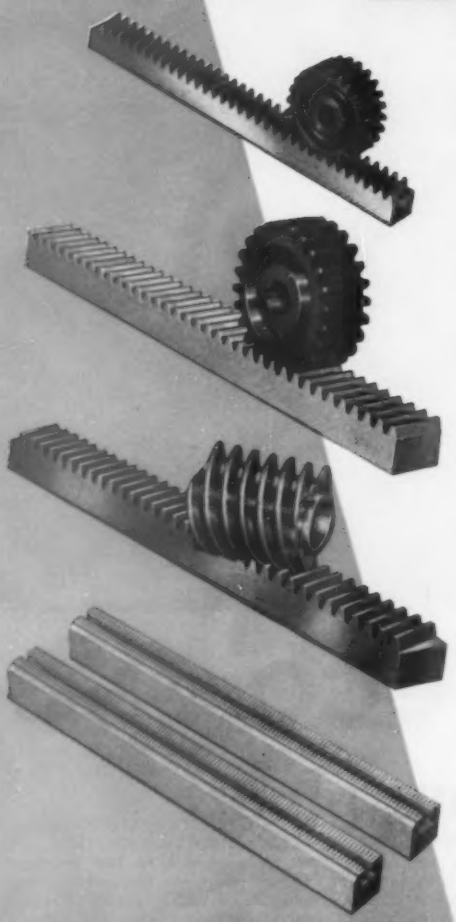
Enter 1256 on Reader Card

GEAR RACKS



...any type,
...any size,
...any material

with quality as a first consideration

Throughout industry, manufacturers depend on ILLINOIS GEAR to meet their exacting specifications for quality gear racks . . . from the large powerful, heavy pitch racks for steel mill equipment to the precision spur or helical racks for machine tools.

And there's good reason; these manufacturers expect *and get* the dependability and superiority proven by the performance of these racks throughout the world.

Whatever your requirements are for changing rotary power to linear power depend on ILLINOIS GEAR for racks that are made right with quality as the first consideration.

Look for this mark ILLG® *. . . the symbol on finer gears*

ILLINOIS GEARS Reg U S Pat Off

Gears for Every Purpose ... one gear or 10,000 or more

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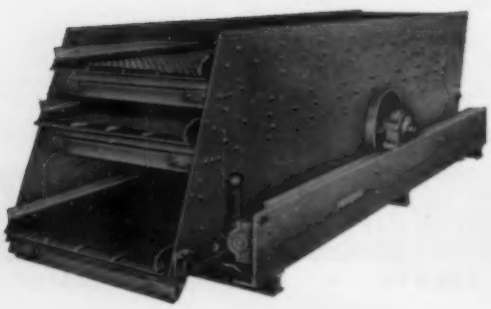
2108 NORTH NATCHEZ AVENUE • CHICAGO 35, ILLINOIS

OPERATIONS IMPROVEMENT

with profit-building SECO screens on-the-job in your plant



The heart of every aggregates production schedule is the screening operation. Here's where the most efficient plant can bog-down, tie-up production and cost you money. That's why it will pay you to take a closer look at the pay-off end of your vibrating screens.

If they are not producing top tonnages of clean material replace them with SECO Screens for:

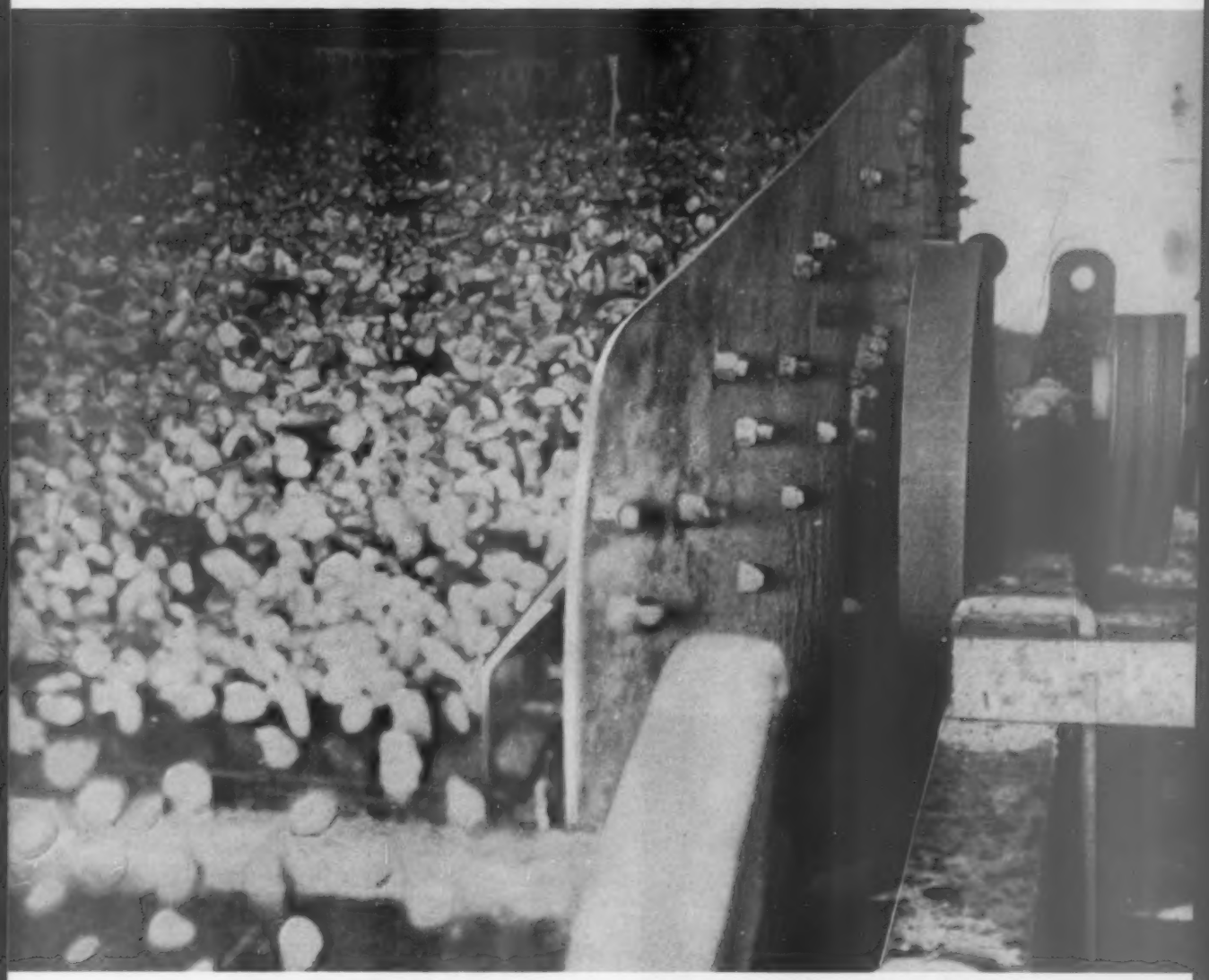
PROVEN PERFORMANCE—SECO Screens assure screening accuracy that is second to none. You can handle the toughest jobs . . . maintain the most rigid specs, for days, weeks, years.

COMPLETE DEPENDABILITY—These are screens that are engineered and built for long, hard wear . . . especially during round-the-clock, peak production periods when there's "no time" for "down-time".

SERVICE—There is no excessive lost time if and when standard replacement parts are needed. SECO ships within 24 hours after order is received.

Have SECO set the profit pace for your operation improvements . . . now.

BEGINS RIGHT HERE ! . . .



- OVER 450 MODELS FOR SCREENING EVERYTHING FROM AG-LIME TO RIP-RAP
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4-BEARING CATALOG #204 AND TWIN BEARING BOOKLET TB-21

SCREEN EQUIPMENT COMPANY, INC.
Buffalo 25, New York

SECO

"TIME CONSCIOUS" VIBRATING SCREENS

Little details build efficiency

BY PAYING CLOSE ATTENTION to "the little things," A. G. Obert, an Illinois stripping contractor, has established a maintenance program that pays big dividends in high production and low repair bills. Over the past seven years on the Colchester Stone Co. limestone quarries in McDonough and Hancock Counties, Contractor Obert has lost no more than one percent of his work time from machines being "down."

He attributes his success directly to the little things in a carefully supervised program of inspection, lubrication and preventive maintenance, coupled with good operating practices by his machine operators. With an equipment spread of three tractors and two scrapers, Obert averages 150,000 cu. yd. of overburden annually during each 8-mo. season from early spring (mid-March) until a solid freeze in the fall, generally mid-November.

Most of the dirt moved involves rock, either as outcropping or as loose rock in the excavated dirt. Haul distances vary, depending on location of cuts and fills, but seldom are less than 300 or more than 1,000 yd.

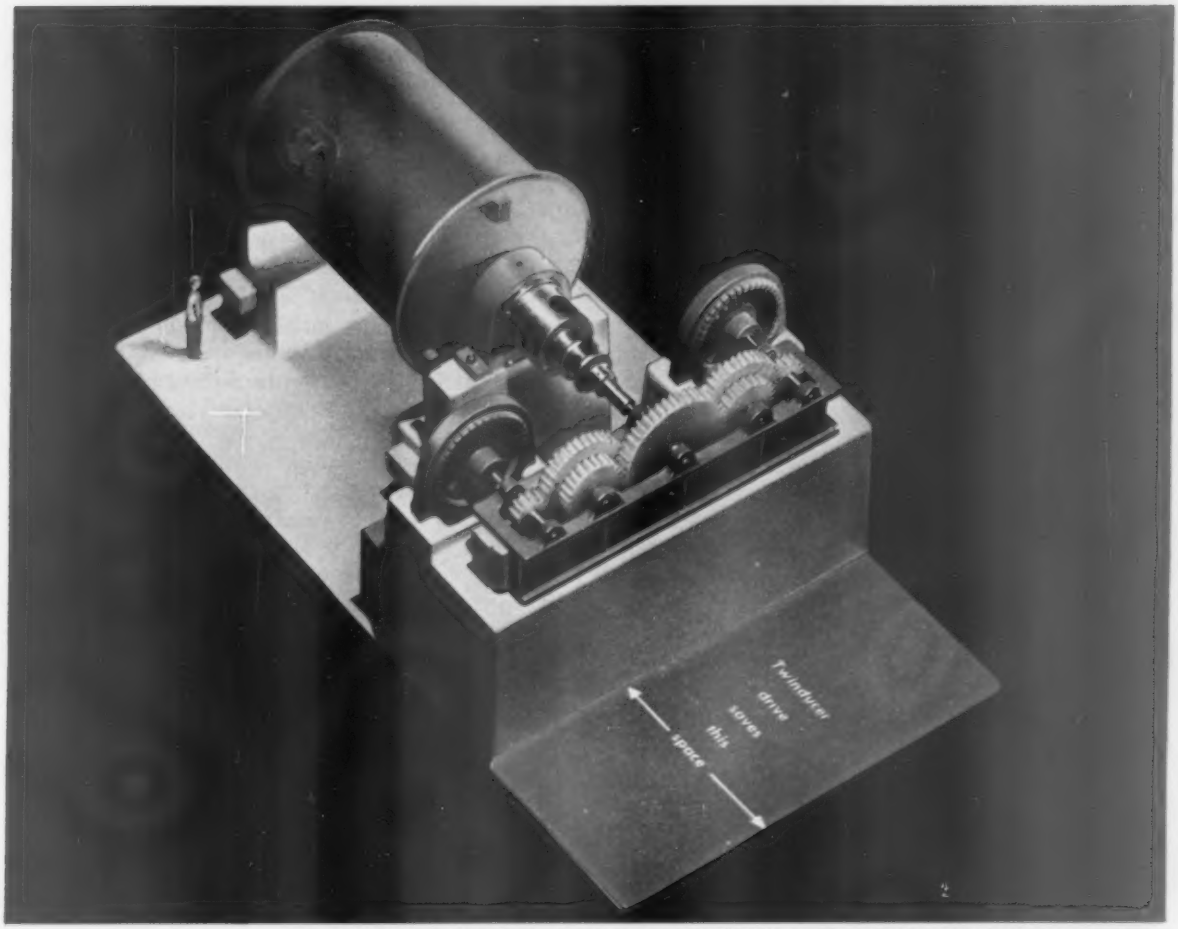
First in Obert's maintenance program comes inspection and lubrication. In stressing their importance, he says, "Maybe I overdo it a little, but why take a chance on having a hundred dollars or so in repairs because of a few minutes or a few cents'

Please turn to page 124

ABOVE: Long roller life is a result of careful machine operation, frequent lubrication and regular gauging

BELOW: This sprocket has more than 7,200 service hours, yet shows little serious wear

ALLIS-CHALMERS



A 2000-hp Twinducer drive mill conserves up to 16 feet of space compared to other trunnion drive designs.

Twinducer drive saves on space and wear...

divides mill loads electrically

Another Allis-Chalmers first — *Twinducer* drive mill — creates new space savings, new long-range operating and maintenance economies.

Dynamic electrical load distribution is accomplished through rotor shift of one of the two motors. Once the load is balanced and the rotor locked in place, there is no need for further adjustment. No need for a floating gear or pinion, either, since electrical, not mechanical, balancing is employed with *Twinducer* drive.

Gears and pinions experience less wear because they are fixed. Wear is further reduced because the gear train runs in a filtered oil bath, promoting longer gear life through both splash and flood lubrication.

Twinducer drive efficiently harnesses the power of *two* synchronous motors located on the mill side of the drive. This unique, compact arrangement reduces drive dimensions drastically . . . as much as 16 feet on a 2000-hp drive.

Twinducer drive promotes better housekeeping, too. No lubricant leakage because the system is enclosed. No oversized foundations, no pits to collect waste materials and dirt.

Ask your A-C representative about the outstanding features of Twinducer drive mills. **Allis-Chalmers,** ***Industrial Equipment Division, Milwaukee 1, Wis.***

Twinducer is an Allis-Chalmers trademark. A-1363

Enter 1241 on Reader Card

continued from page 122

Programmed maintenance and operator training built A. G. Obert's impressive operating record

worth of grease?" As a small operator, Obert carries out the bulk of his own maintenance and lubrication work. Although it adds to the workday, he usually checks machines before work begins to be sure that zerk fittings have been hit with a grease gun. He makes sure that air cleaner oil cups are checked and that lube schedules are up to date.

Lubrication schedules generally are accelerated, especially on track and carrier rollers. These are greased every 16 hr. "They may not need it that often," he explains, "but they almost always can take a touch of grease. This way, I'm sure they're never dry." Tangible advantages of this care can be readily found . . . the oldest tractor has more than 7,200 service-meter hours and is still running on the original undercarriage. "All I've done to it," Obert points out, "is rebuild the grousers once a year."

The two other tractors in the spread are building similar records. One has slightly more than 5,100 service hours and the other has nearly 1,700 service hours. Both have the original undercarriage, except for rebuilt grousers.

As a second part of his productive maintenance program, Obert urges his operators to report or check into anything that seems amiss with the equipment. "Most of the time," he says, "they'll tell me it doesn't sound quite right, or that there's a funny noise in the transmission, and it won't amount to anything. But the main thing is that they pay attention to their machines, and we do catch a lot of little things before they grow into major problems."

By this attentive cooperation, Obert has been able to schedule any major overhauls during the slack winter months, a major factor in establishing a remarkably low downtime record of less than one percent.

Operating practices play a third role in Obert's efforts to hold down maintenance costs and loss of work time. "A poor operator can break you, even while turning out high yardage," he finds.

Some of his operating philosophy includes: "Keep the operators from turning too short . . . don't let them make turns on a hill or sideslope unless they absolutely have to . . . keep the turns lengthened out." Short turning or turns on slopes and hills cause accelerated wear on rollers, rims and rails.

Working in the proper gear and not trying for too deep a cut also are critical factors in extending machine service life. Obert finds he makes little or no sacrifice to over-all yardage production by keeping his tractors working in lower gear ranges. He has experimented several times with working in higher gear ranges and trying to cut cycle times.

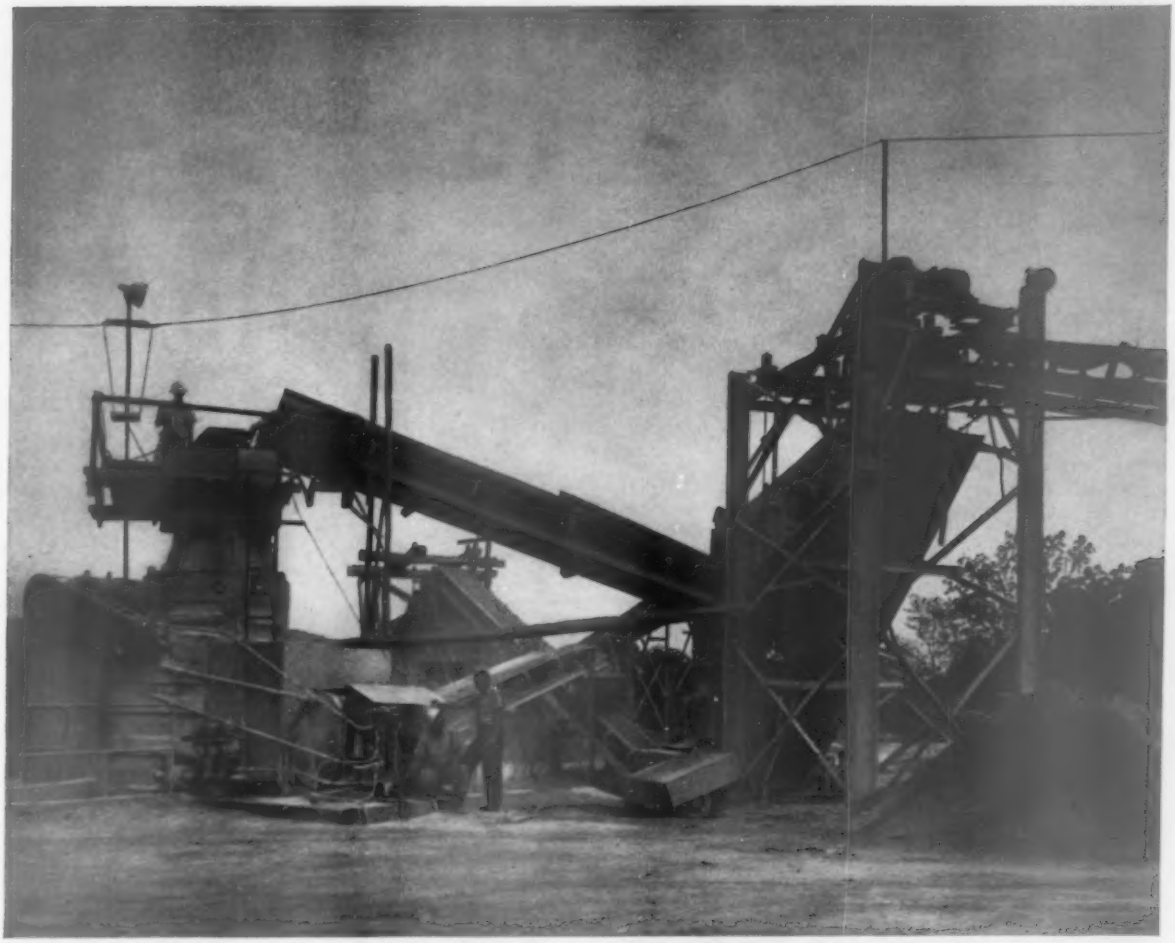
Please turn to page 158

A SWIVELLING PUSH-PLATE was built especially for A. G. Obert. It allows off-angle push tractor approach without denting the dozer blade or endangering the tires

FLAP GUARD keeps dirt out of bearing surfaces of draft arm trunnion, protecting it and prolonging service life. While this is not final answer, it does give some protection

ALLIS-CHALMERS

A-1345



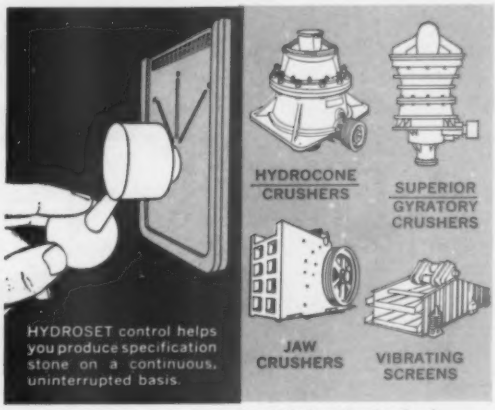
Small switch brings big profits

with Hydroset-controlled crushers paying extra dividends

A shift in the crushed-stone market from 2½" topsize stone to 1" x 0 fines posed a problem for Aggregate Limestone Company, Trussville, Alabama.

To make the switch in production, they installed a 1051 *Hydrocone* crusher as a secondary unit, converted the existing *Hydrocone* secondary to third-stage crushing. This modest investment boosted production 60%, at the same time producing a more salable product.

And Aggregate Limestone Co. won't get caught with the wrong product size again. Their *Hydrocone* crushers are equipped with *Hydroset* control — providing easy adjustment for wear and quick change of product size, as often as necessary and on a minute's notice. Ask your A-C representative about the rugged dependability of *Hydrocone* crushers for reduction — and the product flexibility you get with *Hydroset* control. Or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.


HYDROSET control helps you produce specification stone on a continuous, uninterrupted basis.
HYDROCONE CRUSHERS
SUPERIOR GYRATORY CRUSHERS
JAW CRUSHERS
VIBRATING SCREENS

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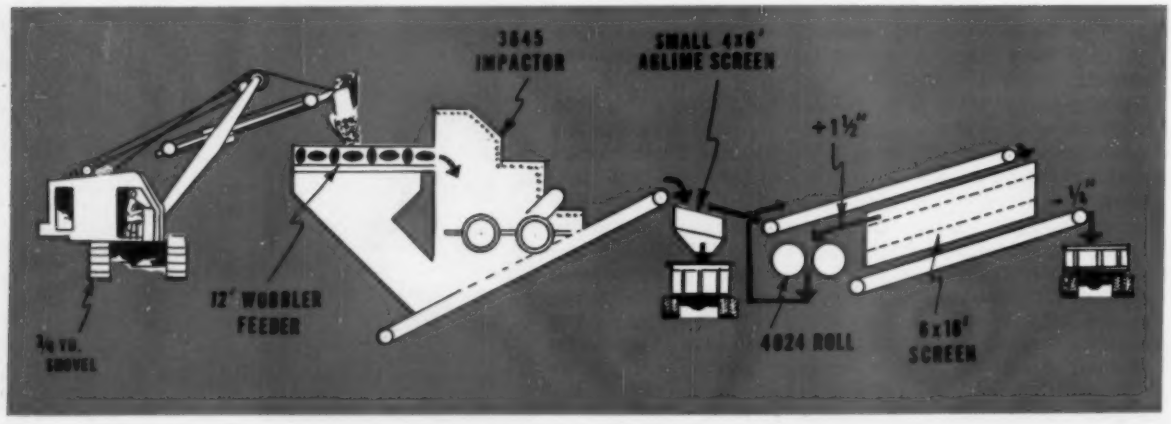
SUPERINTENDENT PAUL WEAVER backs his two-unit portable plant right up to the shot rock in the quarry, eliminating need for quarry haul trucks, drivers

EQUIPMENT ON WHEELS gives Joseph Wenke Quarry a straight-line flow of material



Iowa limestone producer eliminates haulage problems with portable crushing and screening right in the quarry

Portables follow the quarry face

by Kneeland A. Godfrey, Jr.

MOVING ITS TWO-UNIT PORTABLE PLANT right up to the shot rock in the quarry allows Wenke Quarry, Toledo, Iowa, to completely eliminate quarry haul trucks and drivers. Result: an efficient 180 to 275-tph. operation producing over 200,000 tons a year. This volume of aggregate takes only eight men, including three stockpile truck drivers, a scale man and Plant Superintendent Paul Weaver.

A wobbler feeder is another secret of the Wenke operation's success. The first plant processing unit to meet the shot rock, owner Joe Wenke reports it cuts hardfacing time by 70 percent from that required by the vibrating grizzly it replaced. Too, by removing minus 2½-in. stone, it has cut hardfacing time on the primary impactor by easing the load on this unit. Finally, the 36-in. x 12-ft. wobbler is valuable because it does not blind up when taking the wet (5 to 6 percent moisture) limestone fines, according to Mr. Weaver.

Not uncommon in Iowa quarries, the practice of moving the portables right up to the quarry face is a money saver. True, the two portables do have to be moved once or twice a day. But this inconvenience and downtime is more than offset by saving the cost of three quarry-haul trucks and three drivers' wages. Actually, use of portables is the most sensible policy in largely rural Iowa, where a producer must move from plant to plant to keep operating all summer and still minimize haul costs.

Hardfacing the primary impactor has been chopped drastically from three hours a day to about three a week. There are two reasons for this. First, the wobbler feeds take out minus 2½-in. fines, limiting the crusher's effort to only the large rock really needing breaking. Second, Mr. Weaver notes that a semi-automatic hardfacing rig helps. By automatically feeding out welding rod as needed (from a long coil), it speeds welding. The manual method formerly used involved time-consuming placing and removing of short pieces of rod.

Big equipment in a simple plant layout—that's the keynote of the Wenke operation. Either one or two shovels (1½ cu. yd. and ¾ cu. yd.) lift the rock directly from quarry floor to plant. Just five pieces of processing equipment do all crushing and screening. After the wobbler, comes a heavyweight 3645 twin-shaft impactor taking the plus 2½-in. fraction. In open circuit with the wobbler, its product recombines with the minus 2½-in. rock for a short belt run to the secondary plant.

Before reaching this second portable, though, a small 4 x 6-ft. screen removes minus 8-mesh fines. They drop into a waiting rear-dump truck, easing the fines-separating job of the sizing screen. Since up to 45 percent of the stone is minus 8-mesh at this point, the small screen was badly needed. With production at times touching 275 tph., the bigger sizing screen had occasionally been overloaded.

This screen has made the operation much more versatile. Between 5 and 15 percent of the minus 8 mesh is combined with the stockpile of minus 4 mesh. This makes it possible to meet county specifications for surfacing material or Iowa specs for Class A stone or subbase material.

The biggest screen ever mounted on a portable, at time of installation, is the claim Paul Weaver makes for his 6 x 16-ft. twin-deck sizing screen. The hulking screen shares the secondary plant with only one other processing unit—a 4024 roll crusher.

Please turn page

PORTABLES FOLLOW THE QUARRY FACE

continued from page 127

Together the two do final processing. This typically consists of separations at 4 mesh and 1½ in. by the twin-deck vibrator. Oversize is scalped off to the roll, where reduction is made to minus 1½-in. product. Since the crusher is set up in closed circuit with the screen, product is recycled to the top of the vibrator and recombined there with incoming stone.

Two products are made: typically ¼ x 1½-in. roadbase stone, and minus 4-mesh aglime. Rear-dumps, waiting beneath discharge belts at the plant's end and side, catch the two streams of finished stone.

PRIMARY PORTABLE CRUSHER with its wobbler feeder is backed right up to the toe of the pile of blasted rock

ONE OF THE BIGGEST SCREENS ever mounted on a portable unit is this 6 x 16-ft. twin-deck sizing screen

Study has shown that just three drivers are needed to handle the five 7-ton stockpiling rear-dumps. Wenke encourages its customers to come right to the plant conveyors for stone, rather than going to the stockpile.

Product mix breaks down about as follows, Superintendent Weaver explains: Surfacing stone for secondary roads and roadbase, 31 percent of production; minus 4-mesh aglime, 22 percent; high-grade concrete stone, 22 percent; and fluxstone, cobbles and excess fines, 25 percent.

The high-purity concrete stone comes from just one of Wenke's two quarry faces. The 15-ft. bench for the quality stone is at quarry's bottom, in a stratum beneath the 47-ft. bench from which most of the stone is taken. Since there is no hard flint or chert in the concrete-stone ledge, Wenke does the drilling himself with a pneumatic hammer drill. This makes about 90 ft. an hr. of 1¾-in. diam. hole. He strips overburden, too, using his own bulldozer.

But the high 47-ft. face is too hard for anything but the biggest crawler-mounted units, Mr. Weaver states. Hard flint is the culprit. So this task is contracted out to a firm with a rotary, mounting a 6-in. tricone bit. With such drills running $50 to $60,000, the Wenke people feel that for their size of operation the cost is not warranted.

Even though Wenke's vibrator is perhaps the biggest operating on a portable plant, greater screening capacity is needed. So plans are to acquire a second screening plant. This, Paul Weaver explains, will probably take minus ¾-in. stone and permit making two or three additional products. One advantage of the proposed setup, besides giving screening capacity adequate for 275 tph.: a second screen would make a separation at 8 mesh, giving farmers a superior grade of aglime with smaller topsize. This insures quicker benefits in the soil. **END**

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Secondary portable plant: Screen, 6 x 12 ft.; 4024 roller crusher	Universal Engineering. Div. of Poor & Co.
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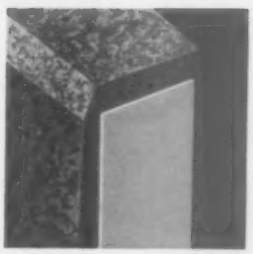

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Drilling efficiency depends on careful attention to the details of keeping a compressor working at top efficiency

Don't overlook compressor maintenance

by Paul C. Ziemke

MORE MUSCLE IS BEING BUILT into air compressors for quarry service these days. When it comes to heavy-duty performance, these machines will be as effective as they were designed to be—if you give them proper treatment. This, of course, refers primarily to lubrication; but around a quarry, adequate filtration to keep dust out of wearing parts is almost as vital.

Consider the alternatives: Unless the maintenance of your compressor is of the best type, you can expect an abnormal increase in temperature with its attendant evils. They include: (1) leaking discharge valves that allow the already-heated air to recirculate, causing an appreciable rise in temperature and loss of efficiency; (2) carbon deposits that cause valves to close or to restrict the discharge orifice, resulting in an increase of discharge pressure; (3) a defective cooling system; (4) failure of the intercooler, forcing the machine to work as a single-stage unit.

When carbon deposits form in air compressor cylinders, it's bad enough. The trouble is compounded when carbon mixes with dirt taken in with the air and with oil that has vaporized and condensed. Collection of these deposits in pockets, elbows and sharp edges of piping or connections

Please turn to page 132

HIGH-PRODUCTION LIMESTONE DRILLING calls for compressors that are carefully maintained

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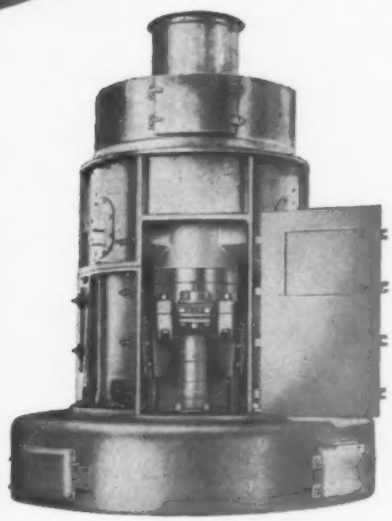

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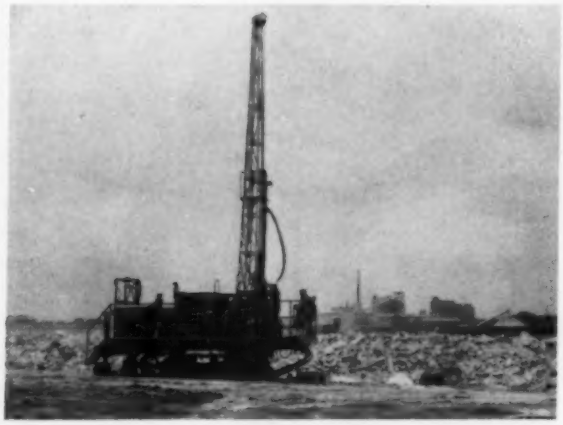
DON'T OVERLOOK COMPRESSOR MAINTENANCE

continued from page 130



COMPRESSORS on the drilling machine require the same careful maintenance as portable compressors

not only are injurious to the equipment itself; they restrict flow of air through the system and interfere with drilling operations.

Besides reducing efficiency and ruining oil film, carbon deposits in the air compressor are a distinct fire hazard. Violent explosions in the receiver have been traced to these deposits. An explosion can occur when highly volatile oil vapors are driven into the receiver and a particle of glowing carbon is injected. Abnormally high temperatures have another disadvantage: they are destructive of hose lines serving the air compressor's complement. This destruction is most marked at the receiver connection, especially where there is a sharp bend in the fibers of the hose.

Whether your compressor is an air or water-cooled type, it will work well only when properly maintained. The end result is to keep normal heat values for the preservation of oil film on the wearing parts and for the extension of the usefulness of the crankcase oil. Fortunately, most machines are of the two-stage design with intercooling facilities that reduce ambient temperatures and increase the life of machine and lubricants.

Using the best grade of oil in amounts prescribed by the manufacturer is your best measure of preventive maintenance. You will do well to heed the advice of the compressor manufacturer in choosing your oil. His testing engineers have subjected the machine to as grueling a test for a 30-hr. run as it will get in a week on a job, even under the most severe conditions. Primarily, an oil should have these qualifications: good film-retaining qualities, heavy-duty detergent, and rust and oxidation-inhibiting additives.

It is impossible to prevent formation of carbon deposits entirely. Petroleum-based lubricating oils, regardless of their type or nature, will either evaporate or decompose to carbon when exposed as a thin film on a hot surface. On the other hand, the extent of this decomposition will depend on the length of time the oil is exposed to such heat. With oils of the same degree of refinement, the one that remains on the discharge valves longest will form the greatest amount of carbon; the ideal oil will leave the valve entirely clean and free from deposits, especially when it is fortified with an additive to prevent rust and oxidation.

Heavy-duty oil is highly recommended for gas and diesel prime movers of mobile compressors because its detergent qualities maintain a "sweet engine." The chemical additive serves not only to keep sludge out of the crankcase and oil filter, but also to keep tarry gum off the piston rings. If the clean, new engine is treated to this oil from the beginning, formation of carbonaceous deposits will be minimized.

The cylinders of an air compressor require an oil of very high lubricating ability, since minimum quantities must be used. The degree of refinement, the tendency to form carbon deposits, the volatility and viscosity of the oil must be considered in determining its suitability. The oil should not be so volatile as to evaporate from the cylinder walls, but should distill completely from the hotter discharge valves in order to reduce the possibility of gum and carbon formation and mechanical failure of the system.

Maintaining the proper oil level is very important, because an oversupply will cause excessive turbulence and subsequent foaming, plus high consumption that causes carbon formation on discharge valves and orifices. Too low an oil level may result in ruined bearings. Late models of mobile compressors are designed so that the scoop will always dip just the proper amount of oil. Several models have an oil reservoir located to collect splashed oil and feed it by gravity to the bearings.

Oil-tight crankcases are desirable because they prevent expensive leaks that can dangerously lower oil levels. Normally, with only the breather pipe open to the atmosphere, fresh air may enter and heated air may leave without carrying in dust if a filter is installed in the line and there are louvers to prevent belching or loss through heavy oil vapors. In large-size crankcases, a portion of the oil

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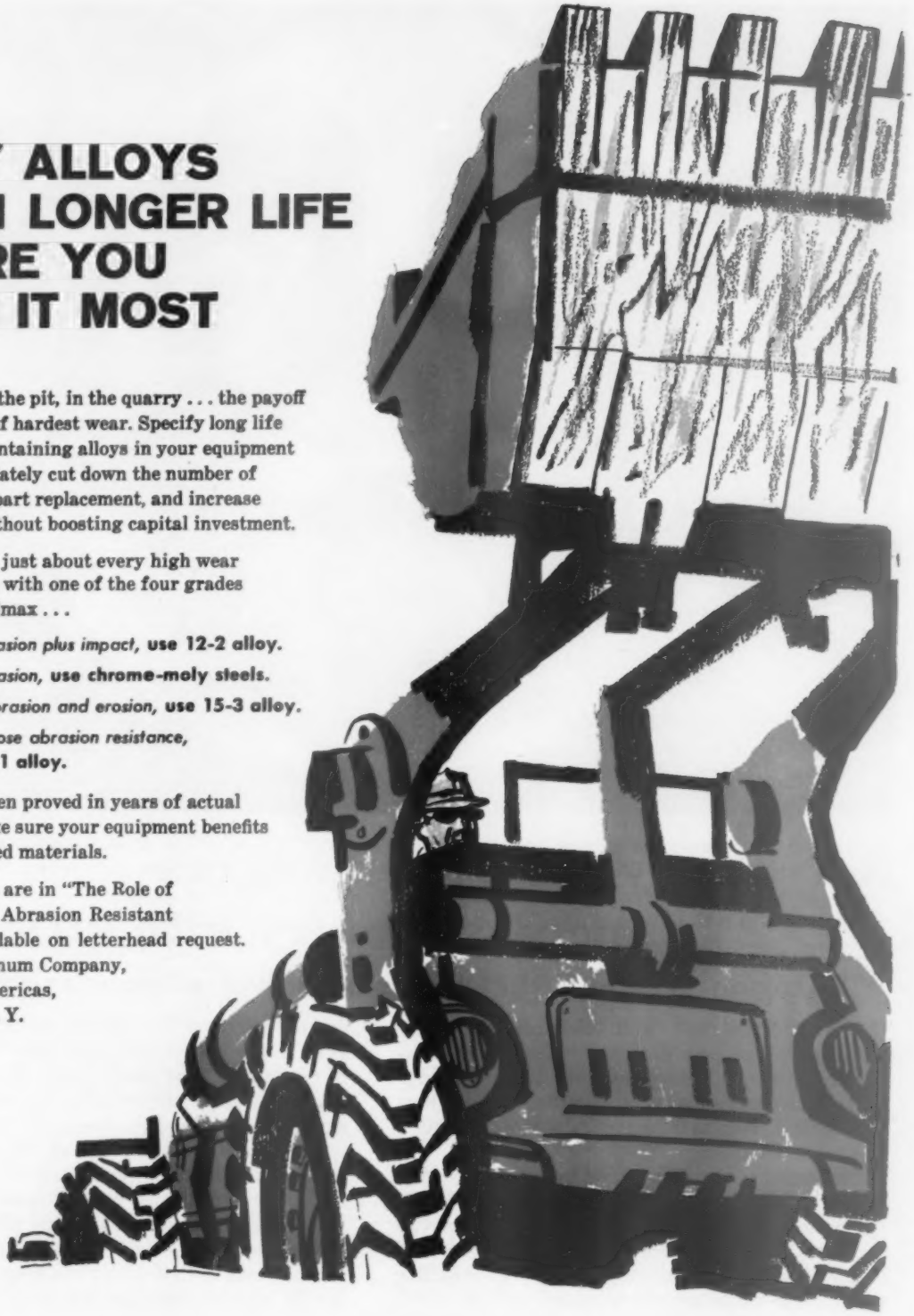

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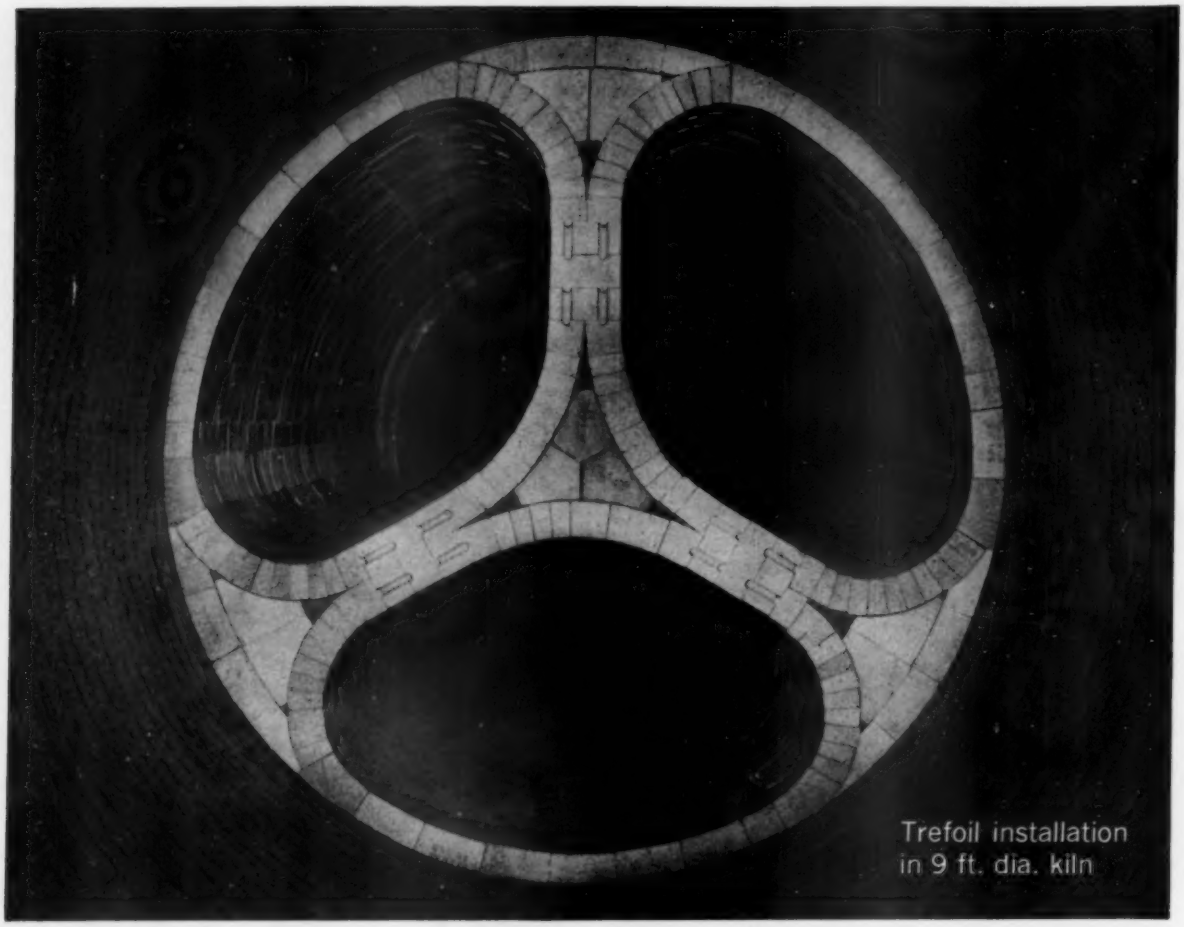

Trefoil installation
in 9 ft. dia. kiln

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The structural strength of the trefoil construction is proving its excellent durability. An original installation in a 10′ diameter kiln has now been in service for three years, with indications of considerably longer life. This good service presently is approaching repetition in a number of other kilns.

The magnitude of preheating of the charge in passing through the trefoil tends to moderate the temperature in the hottest zone, necessary for a given rate of production. The development of excessive accretions in the high temperature zones with certain fuels may be reduced and the lining life extended.

Net results from the use of the trefoil are fuel savings and increased production in kilns which are not greatly overloaded beyond rated capacities.

H-W technical service is freely offered in helping determine various details such as length of the trefoil section (usually 15 to 25 ft.) and longitudinal location for the various conditions involved.

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DON'T OVERLOOK COMPRESSOR MAINTENANCE

continued from page 132

GRANITE DRILLING imposes a great burden on compressors

supply can remain idle and cool off before making another circuit through the system and becoming exposed to heat and contamination.

An air filter is vital to the operation of a compressor since it screens out fine abrasives. It is tragic to note that in many cases the filter is dirty with compacted dust. When it is almost closed like this, the compressor is wheezing for air. But don't depend entirely on appearances. Even if the filter looks clean on the outside, check the interior. Only periodic cleaning will keep the filter working at 100-percent efficiency.

A real advance has been made in manufacturing air compressors for rough quarry use through the provision of ample-sized, fresh-air filters. They protect the compressor parts and tool mechanism and reduce the possibility of accumulation of abrasive or gummy deposits around rings and in air lines.

Analysis of numerous so-called carbon deposits have proved them to consist more of dirt than of carbon, the whole being held together by gummy substances from decomposed oil, especially where the latter has a wide range of distillation, high end point or too high a viscosity. Such an oil will not vaporize cleanly, becoming sticky and collecting dirt brought in by the air. The longer such an oil remains in the compressor, or the greater the volume of oil involved, the more carbon-like deposits will develop.

Neglect can make serious inroads on efficiency, even where an original installation was well planned and erected. To illustrate: A large quarry and ready mix operation had a stationary compressor that was confronted with dust from the drilling and crushing operations. Plant engineers extended the air intake through the roof into a 6 x 6-ft. wood frame, over which new burlap had been stretched to form the first phase of an air-screen setup. This idea worked well as long as the burlap was brushed clean each week. However, there was a change in engineers and the brushing was neglected. In time, the elements ripped the burlap to shreds. Then the factory-furnished filters became loaded in short order and had to be cleaned at frequent intervals as the intake air supply was choked off. Whatever time was saved by eliminating one task was far more than that spent to remedy the resulting situation.

Cleaning the compressor valves at regular intervals is part of an effective maintenance program. First, go over them with scrapers and wire brushes; then give them a final going-over with fine emery cloth. In aggravated cases, where a purge of the cooling lines, a reduction in water temperature and use of a good oil does not appreciably reduce engine temperature, inject a saturated soap-water solution at one-hour intervals.

This mixture consists of 1 lb. of soft soap in 8 qt. of water. Feed it into the cylinder 10 times as fast as the lubricating oil where an automatic oil pump is employed. This will soften hard crystals of carbon and greatly expedite its removal where treatment has been neglected. If it is used as a regular treatment, carbon either will not collect at all, or will not develop into such proportions.

Another suggestion for cleaning the compressor is to apply a lye solution to the discharge line, especially where several machines are coupled in parallel on a permanent-type installation. Dissolve 1 lb. of lye in approximately 8 qt. of water and feed it into the lines by means of a small sight feed lubricator at the rate of 65 drops per min. After the soap or lye treatment, the receiver should be blown down to remove any corrosive fluids. The practice of blowing a receiver at the end of the shift is a good one to keep the water-oil emulsion from forming and setting up active corrosion at the water line on the inside of the tank. Besides, the emulsion can carry over with the air to ruin the lubrication applied to air-driven tools.

Field conditions admittedly impose rigorous duty on today's compressors. But with your attention to these details of cleanliness and lubrication, you can lengthen their usefulness while increasing their service. END

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Australian portland cement producer jumps mill efficiency with new screen for heavy slurries

New sieve extends fine screening range

by E. W. Schroder†

ONE OF THE MOST INTERESTING DEVELOPMENTS in mineral dressing in recent years is the DSM Screen* or sieve bend. It is a relatively new classifier for mineral slurries and was invented and patented by the Dutch State Mines for use in their coal washeries.

The DSM Screen passes the slurry to be classified at a high speed across the surface. This screen is usually curved for convenience and constructed of tapering steel bars (see Fig. 2). The inside of the curved screen is the working surface. Because of the velocity of the slurry tangential to the screen surface, the maximum size of particle that will pass through the screen apertures is about half the aperture width. This is important. If the bars are spaced 2 mm. apart and particles only 1 mm. diam. are being passed through, all tendency towards blinding of the apertures is removed. Separations can now be made at screen sizes which would otherwise be impossible because of blinding.

Capacity of the new screen is very high. This overcomes another difficulty with conventional screening at small sizes. Some of the tangential velocity of the slurry stream is transferred to the fine particles, and very rapid separation occurs.

Several styles of DSM Screen have been designed. All use a screening surface which is a segment of a cylinder. For coarse separations, a 60 or 90-deg. segment is used. For the fine separations required in the cement industry, the 270-deg. screen is a better tool. This is shown in Fig. 3.

The 270-deg. screening surface is made up in three screen segments, each held in place in a steel casing by wooden wedges. Slurry enters through a flanged connection on one side of the casing to a nozzle which directs a flat stream of slurry on

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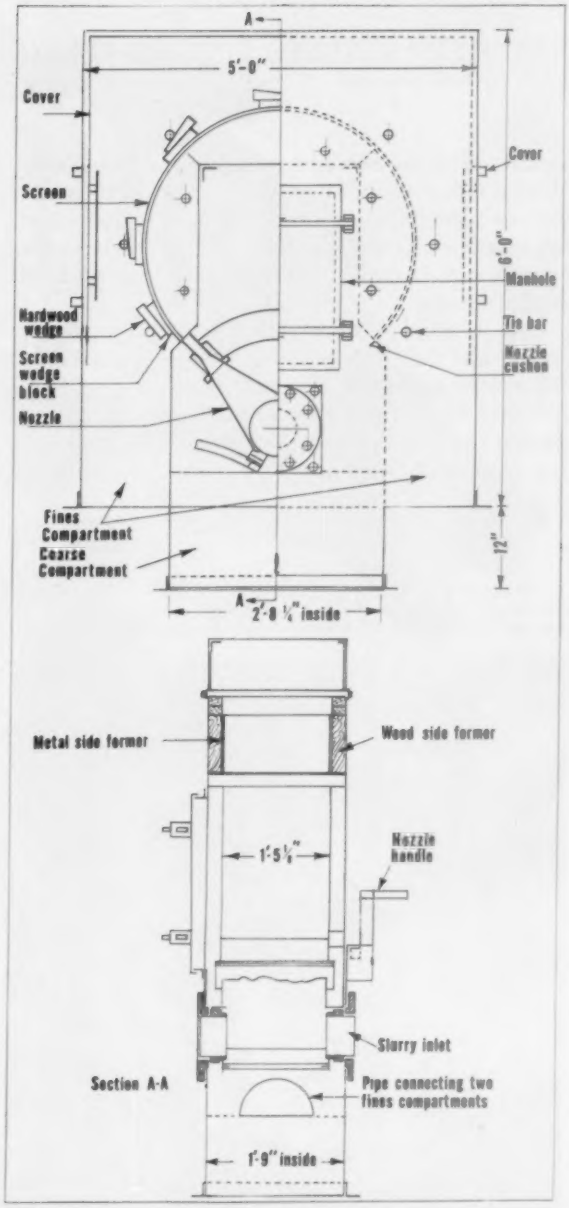


SCHEMATIC ARRANGEMENT of the DSM Screen used at Adelaide Cement Co., Ltd. (by permission of Dorr-Oliver Pty., Ltd.)

*Trade Mark, Dorr-Oliver Inc.

†Chief Chemist, Adelaide Cement Co. Ltd., Birkenhead, South Australia

NEW SIEVE EXTENDS FINE SCREENING RANGE

continued from page 137

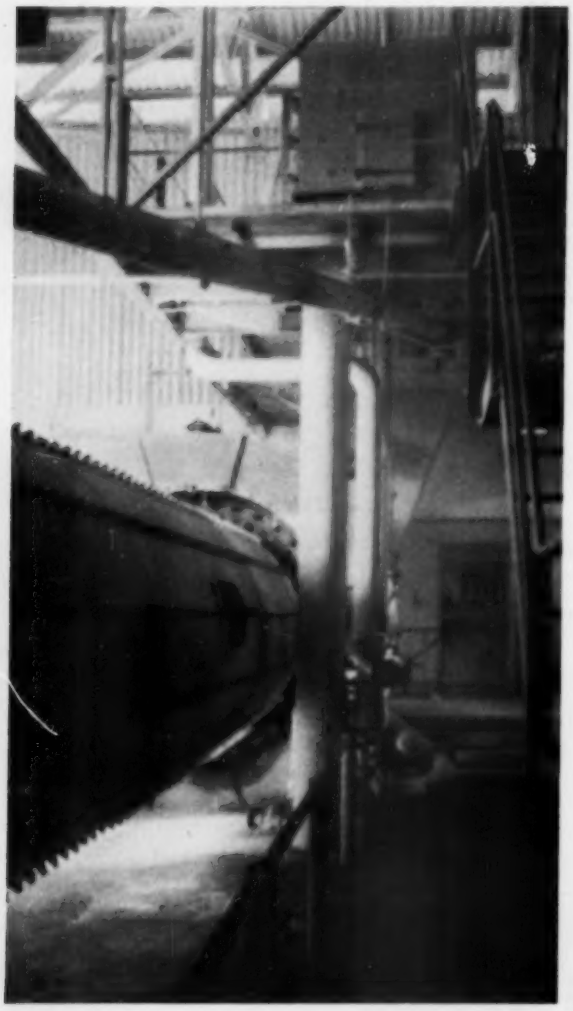
to one end of the curved screen surface. The slurry stream is travelling at sufficient velocity to travel the complete 270-deg. arc. Fines pass through and are collected in compartments on either side of the classifier. A D-shaped pipe connects the two fines compartments.

Coarse slurry passes completely around the screen and falls down into a compartment below the nozzle assembly. The nozzle can pivot about the axis of the inlet pipe and is equipped with a handle for this purpose. It is desirable to reverse the flow of slurry over the screen from time to time. This distributes the wear more evenly over the whole surface and prevents wear on the leading edge of the wedge-wire bars influencing the separation. A manhole door is provided to allow easy inspection of the screen segments when the classifier is not in use. Seals all around prevent leaks.

TABLE I

Screen (Tyler)	Aperture (Microns)	Cumulative Percent Retained: Classifier Feed	Coarse Product	Fine Product	Open Circuit Slurry
48	295	7	11	0.7	0.7
65	208	13	18	3	—
100	147	22	29	11	7
170	88	41	48	29	15
200	74	—	—	35	20
H_2O percent		32.7	30.9	36.7	36.5

THE DSM SCREEN is on the platform above the 7½ x 40-ft. raw mill. Pumps are grouped on the floor to the right of the mill, one feeding the DSM Screen, the other pumping finished slurry to storage



In 1956 we, at Adelaide Cement Co. Ltd., decided to attempt to close circuit the raw milling plant. This is made up of a single 900-hp., two-compartment 7½ x 40 ft. mill. This had been operated since 1948, and full operating data were available. A single small wet cyclone and a 270-deg. DSM Screen were bought for trial. Small scale trials were made, pumping slurry to the classifier and returning it to a tank. These trials were not very fruitful, but the DSM Screen did show more promise than the cyclone. A trial in circuit with the mill was considered to be the only way that worthwhile information could be gained.

The screen was first given a full-scale test in September 1957. Slurry was pumped to it from the mill through large rubber hose. Coarse slurry returned down a sloping pipe to the mill feed end, and fines were pumped away to slurry storage. Between then and March 1958, first the pumps and later the classifier itself were moved to permanent places in the mill room. There has been no break in the continuity of operation since the mill has been operated in conjunction with the classifier.

The complete installation is shown in Fig. 5 and in the photographs. Limestone and shale pass over feed tables to the inlet end of the mill. The mill is equipped with a diaphragm and lifters at the discharge end, and slurry passes through a trommel screen as it is delivered from the mill. The trommel has ¼ x 1-in. slots, and tramp oversize is rejected and returned to the mill inlet by a small bucket elevator and a sluice.

Slurry is discharged into a tank, from which it is pumped to the classifier by a 4-in. sand pump. The classifier is located on a platform with pro-

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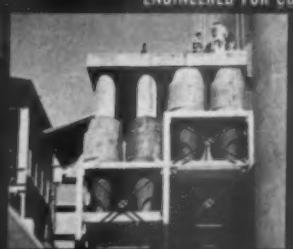

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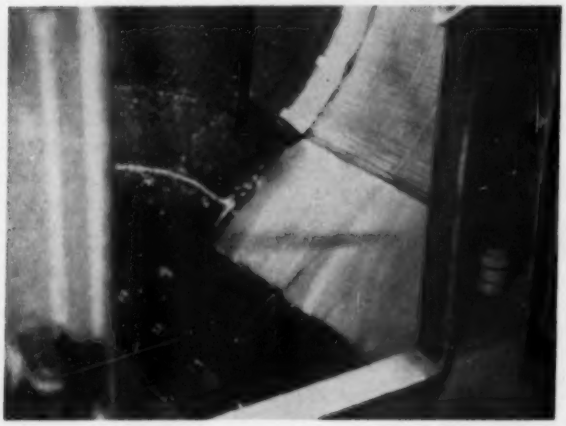
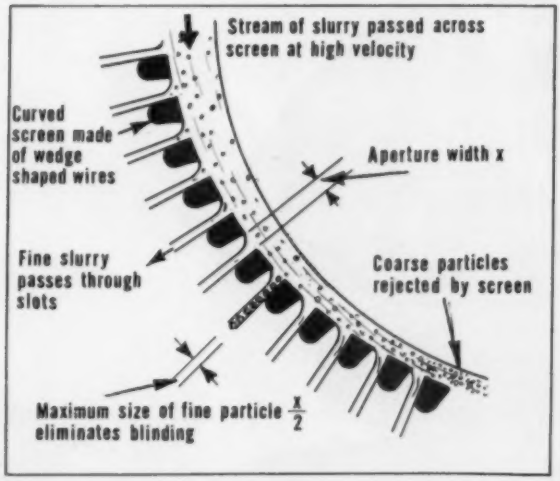
NEW SIEVE EXTENDS FINE SCREENING RANGE

continued from page 138



LOOKING INTO THE DSM SCREEN through the inspection door: the jet of slurry from the nozzle impinges on a stainless steel wearing plate before passing around the curved screen


Stream of slurry passed across screen at high velocity
Curved screen made of wedge shaped wires
Aperture width x
Fine slurry passes through slots
Coarse particles rejected by screen
Maximum size of fine particle $\frac{x}{2}$ eliminates blinding

A CROSS SECTION through the wires illustrates the theory of the screen's effectiveness to make fine separations

vision for drainage to allow for easy hosing down. The screen is a cylindrical surface 40 in. in diameter, nominally 18 in. wide. Rolled stainless steel wedge-wire screens have 0.3-mm. apertures. The effective width is actually 17 in., giving a working screen area of 11.1 sq. ft. Some idea of the high capacity of this type of screen can be gained from the fact that 55 to 60 tons of slurry (short tons, dry weight) pass through the slots in this screen every hour.

Limestone is drawn mostly from our own quarry, which produces a porous, highly fossiliferous limestone of tertiary age. This stone is friable and easily crushed to small sizes but is rather difficult to grind to mesh sizes. This particular trouble is caused by a proportion of hard, massive secondarily cemented material in the limestone. It appears as oversize in the mill discharge. Limestone fines are also bought from another quarry. This is a crystalline, pre-Cambrian material with normal grinding characteristics. From time to time, when the sea transport of limestone to the works is overtaxed, quantities of shell-grit up to 15 percent of the raw mix are used; 1/10th of this is free silica.

The argillaceous components of the slurry are a weathered shale and an equal quantity of an aluminous ash from the boilers of a nearby power station. It will be noted that the boiler ash and shell-grit could be expected to be unusually abrasive when ground. It is interesting to note that screen wear has been moderate despite this.

The screen analyses of the classifier feed and the two products with their moisture contents are given in Table I. A typical open circuit screen analysis is given for comparison. The circulating load is about 180 percent. The figures show that because of the elimination of the very coarse particles, the 170 and 200-mesh residues have been raised to a level which would have been quite impossible under open circuit conditions. The closed circuit slurry is burned quite easily to a free lime content of less than one percent.

The DSM Screen produced a large increase in mill output. Operation in open circuit over many years averaged 41.5 tph. (dry weight). The average in closed circuit has been 59 tph., an increase of 40 percent. Power consumed by the mill has been the same in both cases, averaging 875 hp.; but the closed circuit operation requires an extra pump, an additional 40 hp.

Screen segments are the major wearing part in the classifier. The .3-mm. aperture width was chosen quite early, and only minor trials have been conducted with screens coarser or finer than this. The indications have been that .3 mm. is most satisfactory for the particular purpose. At the time, these were the finest apertures that had been used with a DSM Screen. No trouble has been experienced with blinding of the slots.

The screen segments are made of stainless steel wire with a wedge-shaped section. The first screens had their surface ground to a truly cylindrical shape, but later screens have not been finished in this way. No decline in performance was detected following the change, despite the fact that the tops

Please turn to page 144

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engine power
BY CATERPILLAR

WHY YOU RARELY SEE SMOKE FROM EQUIPMENT REPOWERED WITH CAT ENGINES

Some diesel engines smoke almost all of the time. They can't help it. It's the way they're made. Diesel smoke can be a minor annoyance or a major headache, depending on the way the engine is used—and where it's used.

You rarely see smoke coming from the exhaust of equipment powered by Caterpillar Diesel Engines. This is because of the way they are designed. They are four-cycle engines and each has the exclusive Caterpillar adjustment-free individual fuel injection pumps and non-fouling single orifice injection valves. This system is simple, reliable and economical.

The large single orifice on the injector does not tend to build carbon deposits or foul. You can idle a Cat Diesel without racing it to keep it from stalling out. It will idle and accept a full load instantly and faultlessly. If it's ever necessary to change the injector capsule, you simply remove the injector, unscrew the capsule and screw in a new one, then replace the injector. Anyone can do it and it takes just a few minutes. You save on maintenance costs.

The Caterpillar precombustion chamber permits use of lower cost fuels. Even then, you'll rarely see smoke because of Caterpillar's highly efficient fuel system.

The superintendent of a water diversion tunnel project had this to say about a Plymouth locomotive powered with a Cat D326, "We can pull twice the load and not smoke up the tunnel." Performance of the Caterpillar-powered Plymouth was so outstanding, the company ordered another identical unit.

When you repower with a Cat Diesel, you save several thousand dollars a year on fuel alone, over the cost of, say, gasoline. You save on power maintenance because Cat Engines require infrequent care and are easy to care for. Service and genuine parts are available from your Caterpillar Dealer. The repowering installation is usually very simple and seldom takes your equipment out of action for much time. Compact Caterpillar Diesels put a lot of productive power in relatively little working space.

For new power or repowering, Caterpillar Diesel Engines are probably the most economical you can own. For a fraction of the cost of a new locomotive, repowering with Caterpillar can give you new equipment performance. Ask your Caterpillar Dealer for facts on repowering. He will give you a complete—and impressive—summary of the advantages to you. In the meantime, write for "Caterpillar Engines for Railroad Power" and for "Railroad Equipment Manufacturers' Machines Powered by Cat Diesels." Both will be sent free upon request.

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How to produce 700 tons of sand and gravel per hour ...in multiple sizes

Hewitt-Robins conveyor belting of high-tenacity Enka rayon once again proves its superior strength, top-flight efficiency

In White Marsh, Maryland, just 12 miles north of Baltimore, Harry T. Campbell Sons' Corporation, one of the East's leading makers of building materials, produces 700 tons of sand and gravel in multiple sizes every hour. In order to perform at this top capacity every day, they must use the best equipment possible —Hewitt-Robins conveyors and conveyor belting with strong C/R (cotton and high-tenacity Enka rayon) fabric.

The 36-inch by 200-foot conveyor, shown here, rapidly feeds the raw mass aggregate to a 20,000-ton surge pile at the White Marsh plant. To help accomplish this prodigious engineering feat, Hewitt-Robins chose belting made with high-tenacity Enka rayon. For Hewitt-Robins and other quality manufacturers know that low-cost, high-tenacity Enka rayon industrial yarn is made stronger to operate longer on tough jobs such as this one.

Pound for pound, Enka high-tenacity rayon is your best value in industrial yarn.

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Specify Enka high-tenacity rayon yarns for industrial rubber products, chafer fabrics for truck and passenger tires, heavy-duty sewing thread for multi-wall bag closings and many other vital end-use applications.

Write Hewitt-Robins for the brochure on C/R conveyor belting of high-tenacity rayon and cotton. It gives technical data on strength and other characteristics of belting made with cotton-rayon fabric. Write Hewitt-Robins, Stamford, Conn. Ask for bulletin 24–170.

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NEW SIEVE EXTENDS FINE SCREENING RANGE

continued from page 140

and corners of the wedge-wires are quite rounded. This is at variance with the experience of users of the DSM Screen on other separations.

Some doubt is thrown on the accepted theory of the mechanism of the classifying process. It is said that this depends on the sharp corner of the wedge-wire to separate particles cleanly. Once when the supply of replacement screen segments failed, makeshift screens were made from ordinary wire mesh woven from round wire. After a little experiment, 40-mesh stainless steel wire was found to be most satisfactory. The separation was identical with that of wedge-wire screens, but the life was much shorter.

Three sizes of wire were tried in our plant; all were of the same shape, A section. The three gauges tried have 8, 10 and 13 slots .3 mm. wide per inch. The heaviest wire (8 slots/in.) seemed unsatisfactory, but no difference in the separation of the other two was measurable. Of these two, the heavier lasts longer. Screens are now always ordered with 10 apertures per in., made from section 12A wire.

TOP VIEW of DSM Screen in operation; fine slurry is passing through top screen segment and flowing down both sides

The 270-deg. screening surface of the classifier is divided into three segments. Wear is much heavier on the lower part of the side segments, as these take the impingement of the jet of slurry. Screens with local holes worn through them in this way were patched, but this was troublesome.

A recent innovation has been the rearrangement of the nozzle assembly so that a tangential wear plate takes the initial force of the slurry jet and guides it smoothly on to the curved screening surface. The details of this modification can be seen in Fig. 8. The wear plate is made of stainless steel $\frac{3}{16}$ in. thick. It was made as long as possible in the direction of flow of the slurry; 8½ in. is the maximum length that could be used. These wear plates are easily cut from stainless steel sheet and last several weeks before being discarded. They are held in position by a clamping bolt on each side.

Screen segments are replaced as they wear, which is at rather irregular intervals. The side segments wear faster than the top segment. These can then be inverted if the lower end is showing signs of wear. Screen segments are finally discarded when localized patches have become very worn or when general wear has enlarged the screen apertures from the original .3 mm. to .45 mm. (.012 to .018 in.). This is easily checked with a feeler gauge.

A screen segment currently costs about $92. During the first quarter of 1960 roughly one segment per week was used, costing about 1.3¢ per ton of dry raw mix ground, excluding labor charges which are comparatively minor. This cost must be borne in mind when assessing the economics of closed circuit operation.

The original nozzle supplied with the screen had an opening 16 x 1⅛ in. It is not known for what purpose this nozzle was designed, but it was clearly impossible to maintain a pressure on a nozzle of these dimensions with the slurry available. It was blocked down by the insertion of a plate. As the nozzle area was reduced, pressure increased and the performance of the classifier improved spectacularly. The yield of fines from a given feed increased severalfold as the nozzle pressure increased to 10 psi. A nozzle 16 x ½ in. was soon used, but further reductions in nozzle width were unsuccessful because pebbles of limestone and flat pieces of tramp steel blocked it. Reductions in nozzle area were then made by reducing the length

Please turn to page 146

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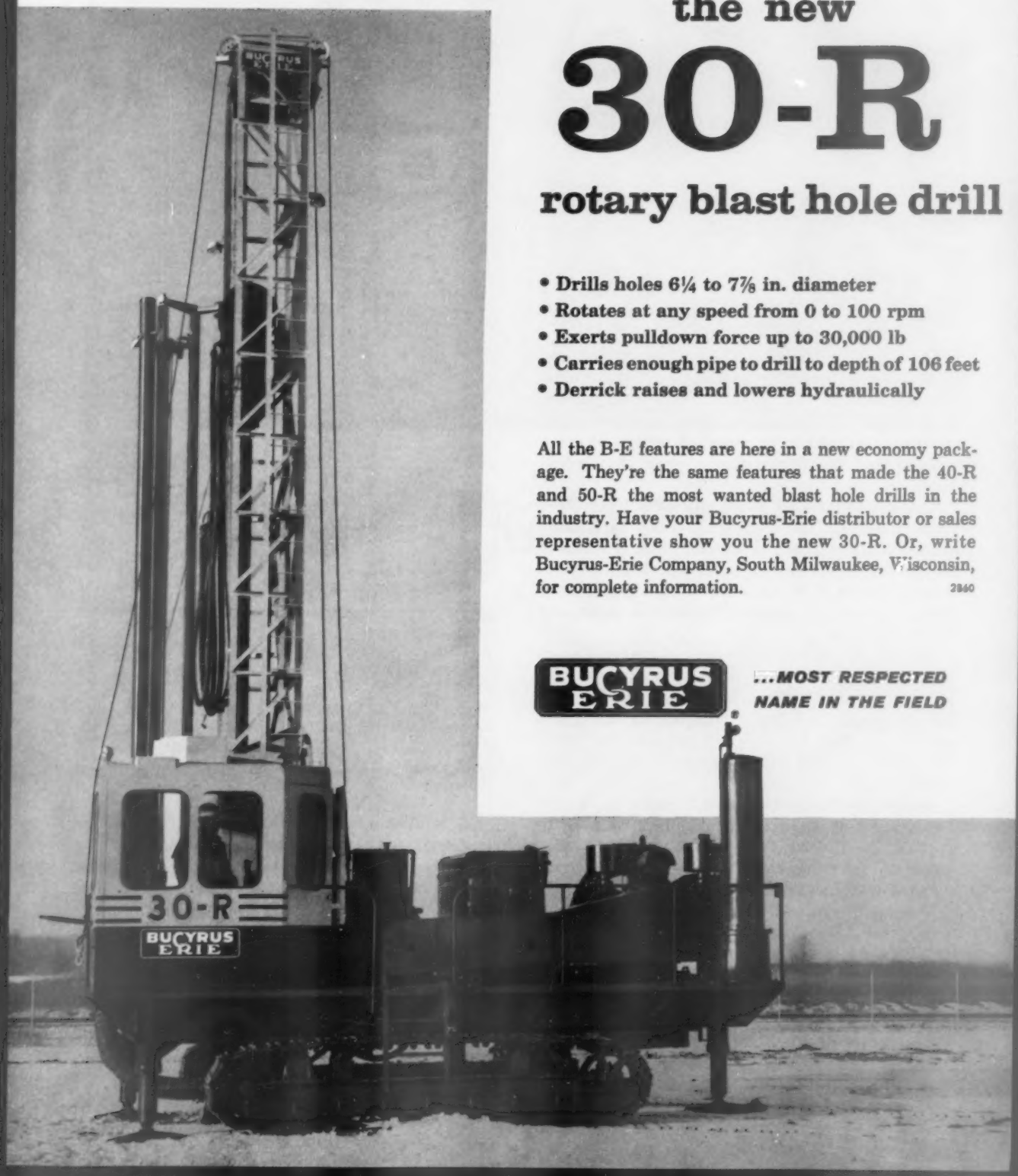

NEW SIEVE EXTENDS FINE SCREENING RANGE

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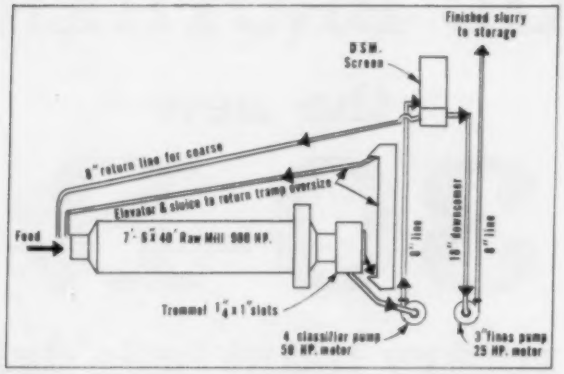
Finished slurry to storage
DSM. Screen
8" return line for coarse
Elevator & sluice to return tramp oversize
Feed
7'- 6" x 40' Raw Mill 900 HP.
8" line
10" downcomer
8" line
Trommel 1¼" x 1" slots
4 classifier pump 50 HP. motor
3" Tinas pump 25 HP. motor

THE CLASSIFIER in a closed circuit arrangement with a mill, elevator and pumps

of the slot, and a nozzle with two jets was evolved as shown in Fig. 6.

The central division and curved lead-in should be observed. The nozzle in use today has a total area of 5.4 sq. in., made up of two jets each 5⅜ x ½ in. Slurry pressure is 25 to 35 psi. There is no advantage in higher pressures sufficient to compensate for the higher screen wear that would occur.

The divided nozzle was originally fabricated from mild steel. Now they are cast in a hard grade of Meehanite. A nozzle costs about $19. It wears to an opening of nearly ¾ in. over a period of several months before it is discarded. This expense is of minor importance compared with the volume of slurry processed.

The greatly increased tonnage of material passing through the mill in closed circuit called for some adjustments in mill loading conditions. This mill originally had two compartments using 3½ and 1¼-in. balls. The mill now has only one chamber and is charged with a ration of 3½ and 2-in. balls.

Loading costs have dropped from 10 to 3.9¢ per ton ground—a saving which far outweighs the cost of screen wear (1.3¢). Higher output is the cause and the elimination of 1¼-in. balls which are expensive and wear rapidly.

Our installation attracted considerable interest among the other Australian cement producers. A DSM Screen is not an expensive item. The price in Australia is roughly $3,600 for a unit that would suit most mills, and several firms gambled the price of the installation with satisfactory results. All plants which have experimented in this way so far are extremely satisfied and have now made permanent installations of the classifier. Increases in output reported range from 50 to over 100 percent—even larger increases than we recorded. Four plants are now using DSM Screens, and another is making an installation. It is interesting to note that local conditions vary considerably between these plants; no two of them are within 400 miles of each other.

We summarize what they tell us about their screen installation:

● Australian Cement Ltd. This company has a 3½-million bbl. plant at Geelong, Victoria. One raw mill has been in closed circuit with a DSM Screen since early in 1959. Three more screens are converting the rest.

Mill size: 7 ft. 6 in. x 38 ft., 820 hp.
Loading: One compartment. Make-up mostly 1¼-in. balls with some 2½ and 4 in.
Material ground: Soft fossiliferous limestone with free silica and clay.
Power drawn by pump feeding DSM Screen: 25 hp.
Nozzle: Split nozzle totalling ⅝ x 8 in.—pressure 20 to 25 psi.
Screens: .3 mm. aperture. Use one segment per week, without wear plates.
Screen analyses:

	Cumulative Percent Retained			
†Screen	Classifier Feed	Coarse Product	Fine Product	Open Circuit Slurry
70	11.8	17.3	2.3	4.4
100	22.2	26.7	9.1	6.9
120	24.8	32.0	12.4	—
150	29.9	35.3	16.7	12.3
170	33.7	34.0	22.2	13.8
200	37.5	42.4	26.2	17.9
300	46.1	46.1	31.3	—
Percent Moisture	36.0	34.0	39.0	—

Outputs: Open circuit, 41.5 tph.; closed circuit, 67.3 tph.; increase, 60 percent.

These results are very similar to those of Adelaide Cement Co. The early operating difficulties described for that plant were closely paralleled at the Geelong plant.

†Some of the screen numbers in this and subsequent data are British Standard.

● Southern Portland Cement Ltd. This firm operates a large plant at Berrima, New South Wales. It is second only to the Geelong plant in size in Australia. A DSM Screen was recently installed on one of their raw mills, and a second unit has now been ordered.

Mill size: 7 x 40 ft., 750 hp.
Loading: First compartment, 4 in.—2½ in. balls; second compartment, 1¼ in. balls.
Material ground: Hard, crystalline limestone and clay slip.
Motor driving pump feeding DSM Screen: 50 hp.
Nozzle: $\frac{3}{16}$ x 13 in.; pressure, 25 psi.

Please turn to page 148

40,000 ABRASIVE TONS

Grinding over 40,000 tons a year of lightweight aggregate produced by a patented process from bituminous coal refuse is the job of this AMERICAN #9 GRINDER, owned by Trulite Corporation, Ceredo, West Virginia.

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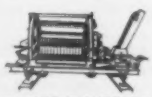
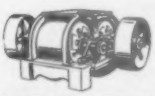
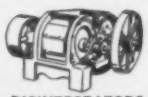


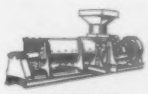
ELECTRIC CUTTERS



SMOOTH ROLL CRUSHERS

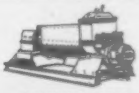


DISINTEGRATORS



PUG MILLS

GRINDERS



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NEW SIEVE EXTENDS FINE SCREENING RANGE

continued from page 146

Screens: .3 mm. aperture. Wear plates have been installed, as at our plant. Screen use averages one segment every 2 to 3 weeks. The relative positions of segments are changed from time to time to distribute wear evenly.

Screen analyses:

	Cumulative Percent Retained			
Screen	Classifier Feed	Coarse Product	Fine Product	Open Circuit Slurry
14	0.5	0.7	Nil	Nil
20	1.0	1.7	Nil	Nil
28	2.0	3.7	Nil	0.2
48	8.2	13.9	0.2	0.8
100	21.2	31.4	7.7	4.3
180	34.4	45.1	21.4	12.0
200	35.4	45.8	22.6	13.5
Percent Moisture	31.0	29.0	37.5	38.0

Extra water is added at the pump inlet to make this slurry more pumpable.

Outputs: Open circuit, 28 tph.; closed circuit, 65 tph.; increase, 130 percent.

This increase in output is phenomenal. The low 48 mesh residue is particularly good.

● North Australian Cement Ltd. This company has a plant at Stuart, North Queensland, and has very recently put a DSM Screen into service on their single raw mill.

Mill size: 6 ft. 6 in. x 36 ft., 600 hp.

Loading: First compartment, 3½ in.; second, 1¼ in.

Material ground: Hard crystalline limestone and clay.

Pump Feeding DSM Screen: 60 hp.

Nozzle: Pressure is not known accurately, but is estimated at 20 psi.

Screens: .2 mm. aperture. Being a new installation, not much data is available on screen wear. Several weeks average screen life is anticipated.

Screen analyses:

	Cumulative Percent Retained			
Screen	Classifier Feed	Coarse Product	Fine Product	Open Circuit Slurry
25	2.1	5.2	0.3	0.2
52	8.3	17.4	1.4	1.0
100	15.5	29.6	5.1	4.7
200	28.8	44.2	18.2	15.0
Percent Moisture	32.2	29.6	34.7	37.5

The closed circuit figures refer to test running on straight limestone, whereas the open circuit analysis refers to burning slurry. The lower moistures in closed circuit are very encouraging, however. The proportion of 25 mesh material is attributed to the screens being very worn in places.

Outputs: Open circuit, 30 tph.; closed circuit, 45 tph.; increase, 50 percent.

This plant used .3-mm. screens initially, but later went to .2-mm. apertures, which they now prefer. Screen segments with .15-mm. apertures are sought, but there are manufacturing difficulties.

The circulating load, from the above figures, is about 60 percent. This is much lower than in other plants, which range from 130 to 180 percent.

Current moves are to increase slowly the 100 mesh residue until burning becomes more difficult. About 7.5 percent on 100 mesh was burned without any difficulty.

● Queensland Cement & Lime Co., Ltd. Works at Darra, Queensland. This company uses dredged coral as its raw material, and it is exceedingly difficult to grind. A rod mill has been installed to reduce the feed to ball mills, and a DSM Screen has been bought to close circuit a ball mill experimentally, but it is not yet installed.

It would be idle to claim that the DSM Screen is the perfect classifier for the wet process cement plant, and its merits must be considered in relation to other devices in current use.

The DSM Screen will operate with very thick pulps; in fact, it may be said that any slurry which can be pumped will classify satisfactorily. The fine slurry does carry more moisture than the feed, but this is due merely to the extra colloidal material in that product. It does not result from a difference in viscosity as is the case with wet cyclones. There the fines are noticeably thinner than the coarse. The DSM Screen can be fed with slurries much thicker than fine vibrating screens can handle.

Only the DSM Screen and the wet cyclone can attempt a classification at 100 mesh. Vibrating screens are not used with success below 50 mesh, so grinding circuits using vibrating screens have developed along the lines of a preliminary mill in closed circuit followed by a mill in open circuit. In consequence, some of the savings of closed circuiting cannot be gained. A DSM Screen in conjunction with the second mill should be a valuable addition to layouts of this pattern.

The DSM Screen consumes no power directly, but the pump horsepower required to feed it is considerable. In this respect, it is at a disadvantage compared with vibrating screen installations. But it has a marked advantage over cyclones, where much higher pressures are employed in thick pulps.

Wear on the DSM Screen is an item of some expense, as with cyclones. Wear on pumps occurs whenever a closed circuit layout is used, but becomes significant only when very high pressures are used.

Adelaide Cement Co., Ltd., has authorized the main data in this article. Australian Cement Ltd., Southern Portland Cement Ltd., North Australian Cement Ltd. and the Queensland Cement & Lime Co., Ltd., have willingly supplied a great deal of very helpful information.

The DSM Screens were supplied by Dorr-Oliver Pty., Ltd. They have given permission to print the diagram of the screen. END

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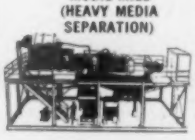

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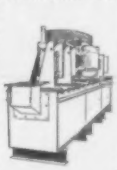
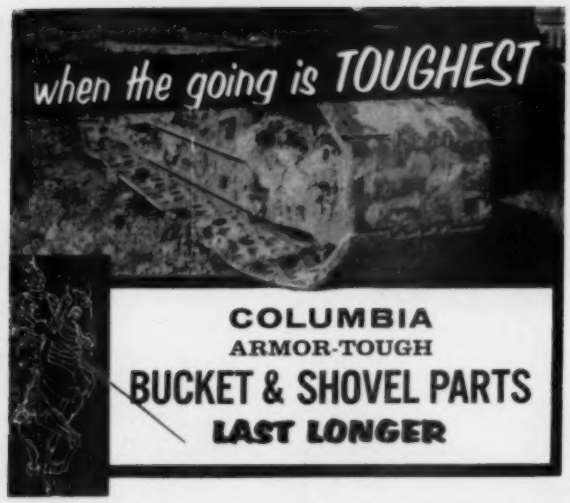


PUMPS



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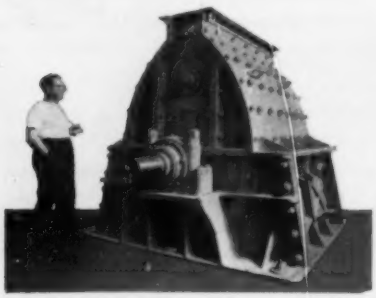

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ROCKY'S NOTES

continued from page 23

water molecules or (OH) ions and is, thus, "hydrated" and in suspension in the milk of lime bath.

The reaction between the two, which must be almost entirely a colloidal chemical reaction, is what forms the small globules of hydrated calcium silicate which are now generally recognized as a colloidal product. It will be noted that reactions of atoms and ions, as such, are here not the important things to understand. The colloidal particles of lime and silica may be many times (thousands or millions) the mass of atoms, yet their chemical properties are much the same.

As our author explains: "Concomitant with the size is the charge. Whereas classical chemistry deals with ions of one or a few electronic charges, the giant colloidal ions may carry dozens or thousands. Much stronger electric forces result, so that complete dissociation becomes the exception rather than the rule." Thus, as our author states: "The particles may be primary, or they may be aggregates. If they interact strongly with the solvent, and especially if they entrap it, their hydration becomes important."

This comprehensive treatment of the subject can best be illustrated by an abbreviated table of contents: "Why colloid chemistry; some structural elements; sedimentation rates; some aspects of flocculation; diffusion and Brownian motion; colligative properties; sedimentation equilibrium; sorption; some applications of sorption; fluctuations and rubber elasticity; the preparation of colloids; descriptive rheology; structural rheology; electroneutrality; the double layer; electrokinetics; some charge effects in colloids; optical phenomena, refraction and schlieren, interference, scattering."

Some of these subjects may appear far removed from cement and concrete, but they are all part of an accepted theory. Sorption is probably the most easily recognizable property because its results are quite apparent in concrete. In a colloid solution, sol or suspension, the smallest particles tend to attach themselves to the larger particles by forces not too well understood—something presumably akin to gravity, which prevents minute human beings on our planet from falling off into space! The scientific explanation is that these small particles, or ions or molecules, are attracted and held by van der Waals forces, and these forces cause induced dipoles in the adsorbed particles where they were nonpolar at the start. A dipole, of course, means that the particle, like a stick magnet, has a positive charge at one end and a negative charge at the other.

That means, for example, that a particle, say a particle of crushed silica, has surface charges

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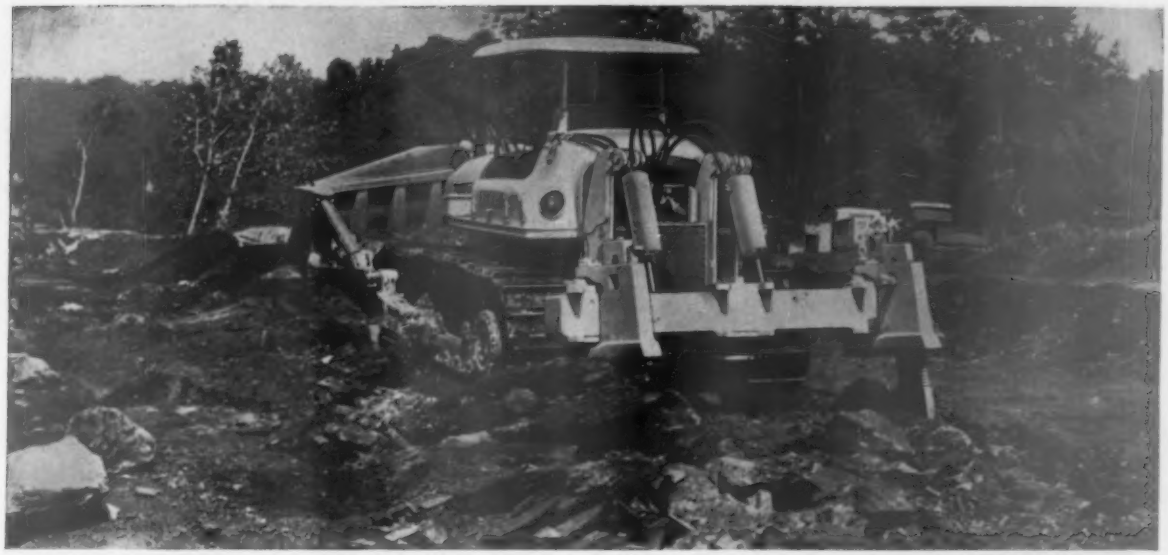

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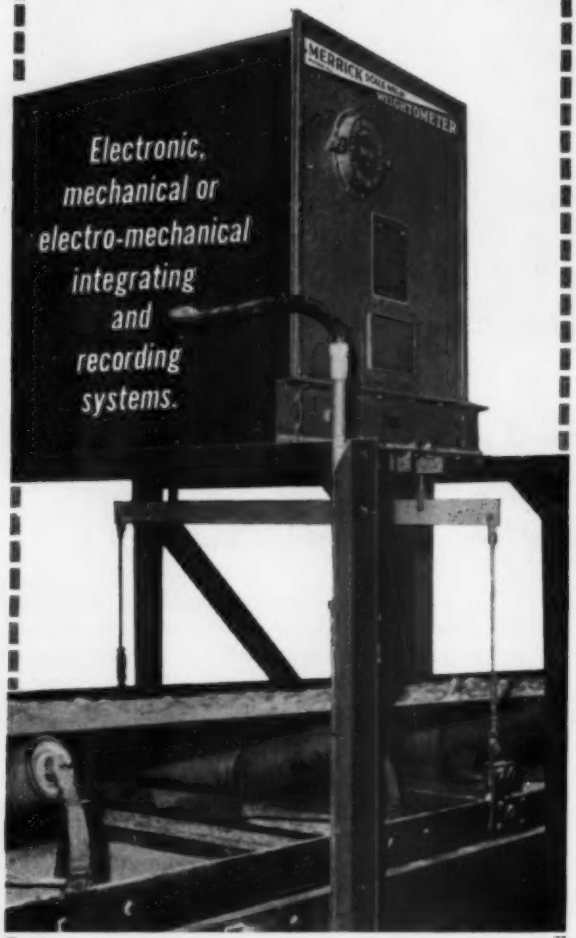

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ROCKY'S NOTES

continued from page 150

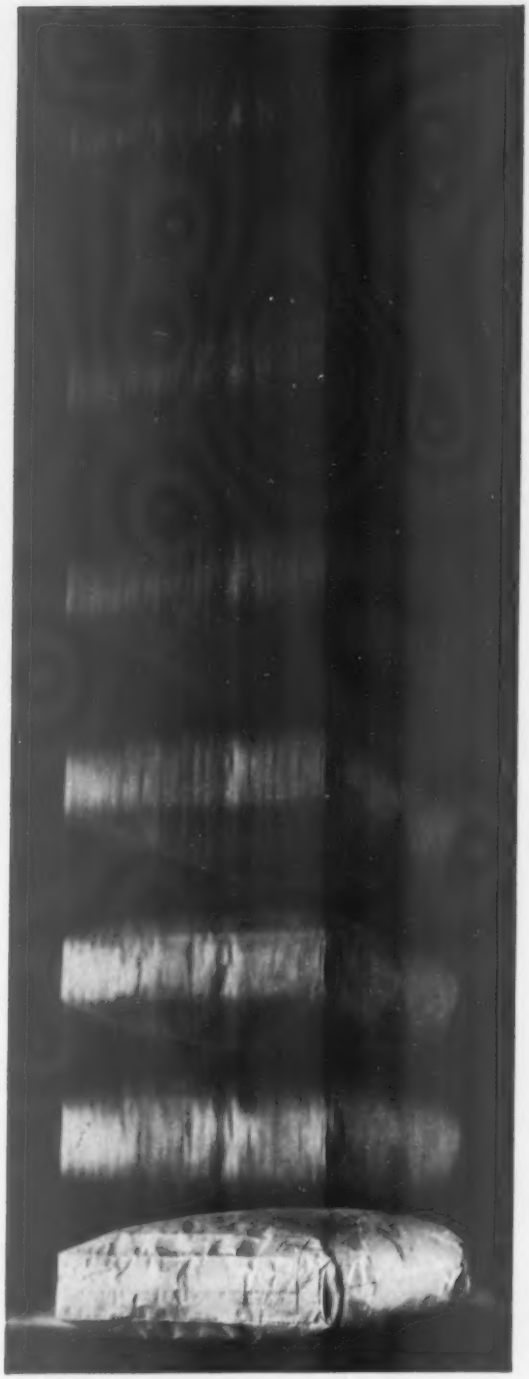
where bonds between Si and O have been broken. The exposed or unsaturated Si ion will have a positive or cationic charge, which means it will attract and sorb particles of negative or anionic charge. Where the O ions of the silica particles are exposed, these having a negative or anionic charge will sorb positively charged particles or cations. A crushed particle of portland cement clinker, having also broken Ca - O bonds, probably offers a surface like silica capable of sorbing both positive and negative charged particles, ions or molecules in various amounts, depending on the surface characteristics of the particular particle.

However, we are not done with the particle when it has sorbed a coating of smaller external particles, ions or molecules. When these are polarized, it is obvious that the nucleus particle may now carry a charge, the reverse of its original charge. Hence, several or multiple layers may be built up on the original particle, changing the charge each time. Each layer will thus give the particle, or the aggregation of particles containing it, different physical properties. For example, the bonds formed by the outer layers get weaker as they are more distant from the nucleus. One application of these facts to concrete is the use of admixtures of various kinds—some of which will flocculate the hydrated cement particles, causing more rapid settling or sedimentation; some will deflocculate or disperse the particles, delaying settling or sedimentation. One or the other must be a desired objective in making concrete, but which?

In a paper, referred to above, by the Australian G. M. Bruere entitled, "Mechanisms by Which Air-Entraining Agents Affect Viscosities and Bleeding Properties of Cement Pastes," he is dealing with modern colloid chemistry. His research shows how entirely different is the colloidal reaction of two types of air-entraining agents. He reports that agents like sodium abietate make the cement grains hydrophobic (water repelling), increasing the paste viscosity (reducing the flow) because of "(1) the effect of air bubbles attaching to cement grains and linking them together; (2) the increase in interparticle attraction produced in the paste by adsorption of the agent; (3) the presence of air bubbles which increase the surface area of solids per unit of water volume in the paste. The factor (1) predominates over factors (2) and (3)."

"In air-entrained paste containing agents like saponin and calcium lignosulphonate factor (1) is absent, and factor (2) reduces interparticle attraction and is, therefore, acting in opposition to factor (3). This means that air entrainment should improve such properties of fresh concrete as cohesiveness and resistance to segregation only when

Please turn to page 154



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Bemis EXTENSIBLE Multiwalls

They are better than conventional multiwalls because they are shock-resistant. More than two years of use has proved that breakage is greatly minimized. And they frequently cost less because the greater strength lets you use a lighter basis weight bag. Read these convincing quotes from men who know from experience about Bemis Extensible Multiwalls . . .

Cement plant superintendent:

"These extensible bags are the best paper bags we have ever used. As far as I am concerned, we won't use anything else."

Cement packhouse foreman:

"I caught my men amusing themselves by letting these 'rubber' bags run off the end of the conveyor and bounce on the cement floor. Our regular bags burst on this drop."

Assistant cement packhouse foreman:

"We broke only two bags in two weeks. We don't want anything else."

Assistant cement plant superintendent:

"Your extensible bags have eliminated our serious customer complaints."

Cement company traffic manager:

"I didn't believe you before, because I have heard exorbitant claims in the past. Now I am sold—we haven't had a serious complaint since we switched to your 'stretch' bag."

Bemis pioneered extensible multiwalls, so we have had longer experience with them than any other bag maker. You can profit by that experience. Get in touch with your Bemis Man promptly.

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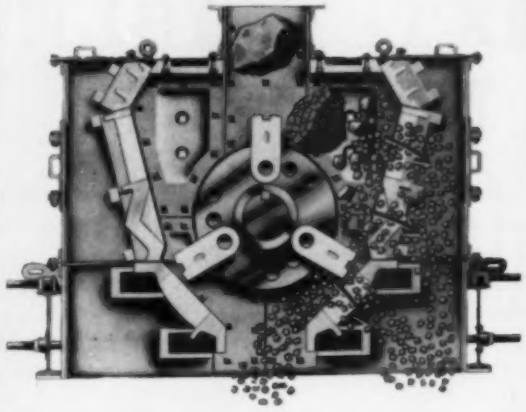

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Increases production as much as 50%

Grates on both sides of the breaking chamber let sized material through. The sized product is not dragged through the Impactor by the hammers . . . recirculating loads are reduced. This exclusive Bulldog Hammermill feature, plus larger breaking chamber, gives you greater production with less power . . . less hammer wear . . . lower reduction costs.

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ROCKY'S NOTES

continued from page 152

air-entraining agents of the sodium abietate type, which make cement hydrophobic, are used."

Our author gives an example of a reversal of particle charge in these words: "In cement pastes containing low concentrations of hexadecyl trimethyl ammonium bromide, the surface-active molecules are adsorbed with the nonpolar ends oriented toward the water. This makes cement grains hydrophobic and increases paste viscosity. In pastes containing high concentrations of this agent, a second layer of molecules is adsorbed on the cement grains with the polar ends oriented toward the water. This makes cement grains hydrophilic (water-loving) and also reduces paste viscosity."

Thus it is not only a case of what admixture is used, but how much of it is used. There is on the market today a variety of cement and concrete admixtures, all designed to improve either the placing of the concrete or the quality of the final product. Presumably the admixture manufacturers are using a knowledge of colloid chemistry, but the concrete manufacturer or user is left pretty much in the dark as to what the admixture is specifically intended to do. So far as we know, he is seldom aware whether he is attempting to flocculate or deflocculate the cement in the paste; or which is the preferable goal. Who knows whether a quickly flocculated sedimentation, that perhaps would give a dense impermeable concrete, might not be preferable to an air-entrained concrete? **END**

"ENGINEER" YOUR PROFITS

continued from page 94

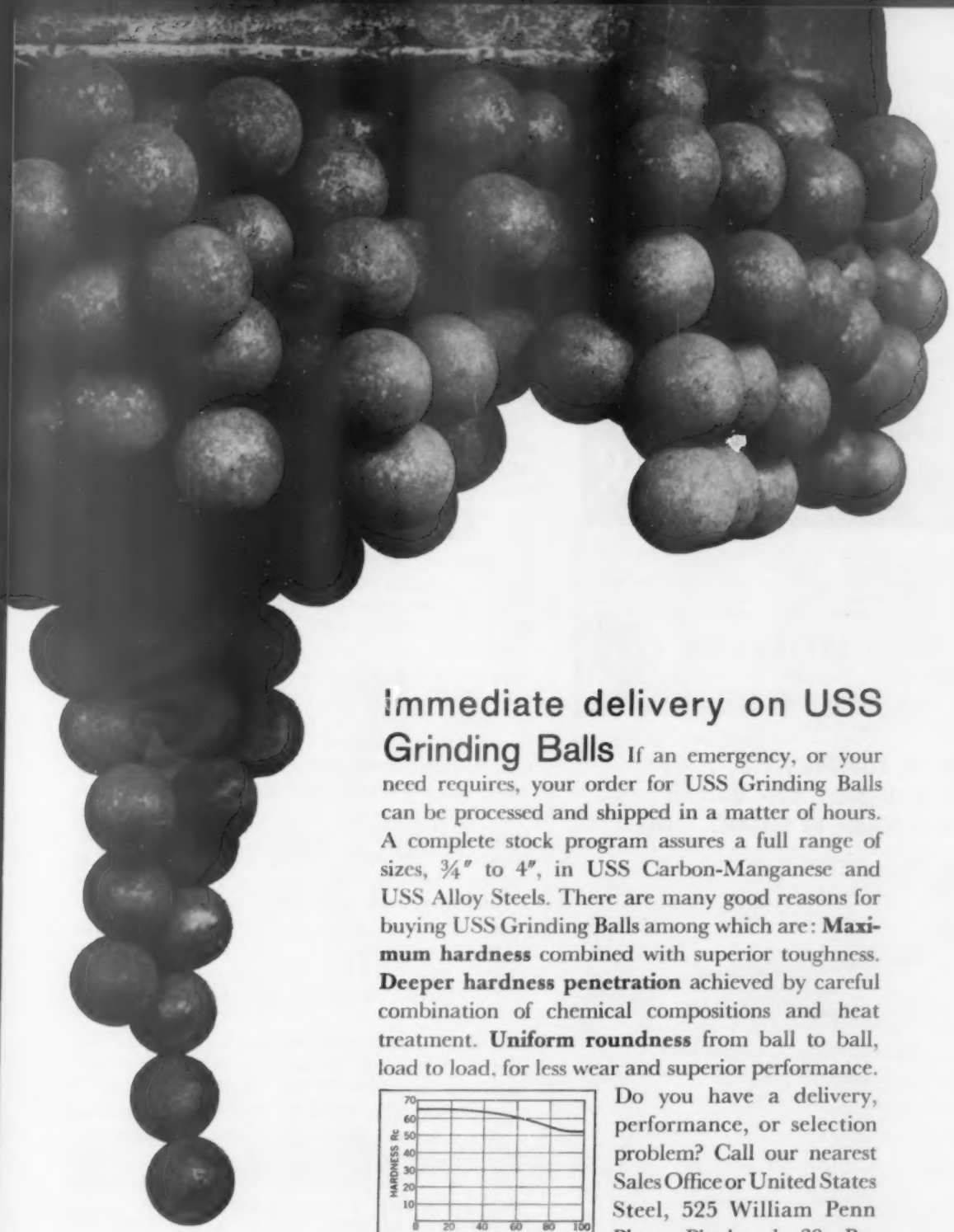
factors pertinent to design, construction and operation of all equipment and processes.

This is a unique specialty. Because they're specialists, consultants or engineering firms can jell all pertinent data into the most effective arrangement and design to suit any project.

This kind of service and help may be found in individuals or groups of individuals. Larger, specialized engineering firms can supply recommended solutions to any type and magnitude of engineering problem or project in whole or in part. The service is applicable particularly to those producers who do not have the engineering personnel to do the specialized jobs. But it isn't limited to the small or medium-sized operators. Some of the largest producers in the country have used this service for many jobs or projects, big or little, with good results.

Engineering help of this type may be considered

Please turn to page 156



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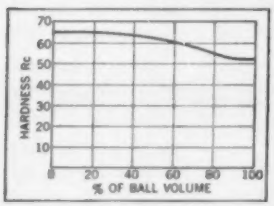

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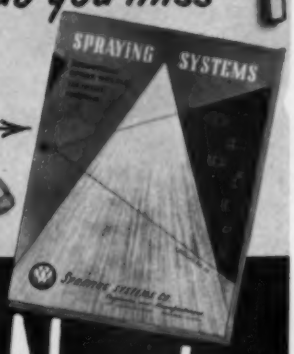

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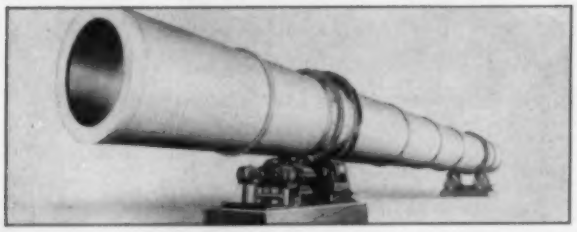

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"ENGINEER" YOUR PROFITS

continued from page 154

as an investment itself. As one producer expressed his experience, having contracted for the design of his brand new plant: "Anyone can build a house, but one can get a much better job if he hires an architect."

What's the extent of this service? Just about anything you want. More specifically, here's a partial list of types of help you can get: feasibility studies, process evaluation, design and engineering, economic studies, consultation, laboratory testing, field exploration, cost estimates, selection and/or purchase of equipment, erection and construction, engineering drawings. Some large engineering companies are set up to do construction work too. Thus, they can give you any or all of these services—right up to the complete job from the very beginning to the final operating plant.

A combination engineering and construction job is called a "turnkey" job—includes the whole works. It begins with consultation, a look at the property, raw materials and market. Next comes the preliminary engineering work.

Processes and systems are recommended; drawings are prepared, equipment studied, specified and selected; alternate proposals made, and costs estimated. Then, when specific agreements between producer and engineering firm are concluded, equipment is ordered for scheduled arrival dates, construction and erection planned on a regular schedule, and the work of putting the whole program together in the form of a physical plant is begun. On completion and acceptance, the plant is turned over to the client.

Advantages claimed for a complete job are many. One is centralization of responsibility for all work and plant at one spot. Another is ability to save money and time through complete control over all phases of erection and construction.

How can you arrange for such service? Just contact the consultant or company. A discussion will result in an outline of the special conditions of your project, whether it be a small modification or a complete new plant. Then, the specialists are ready to enter into a preliminary engineering agreement with you to cover a detailed study of your problems or project by the engineer or firm.

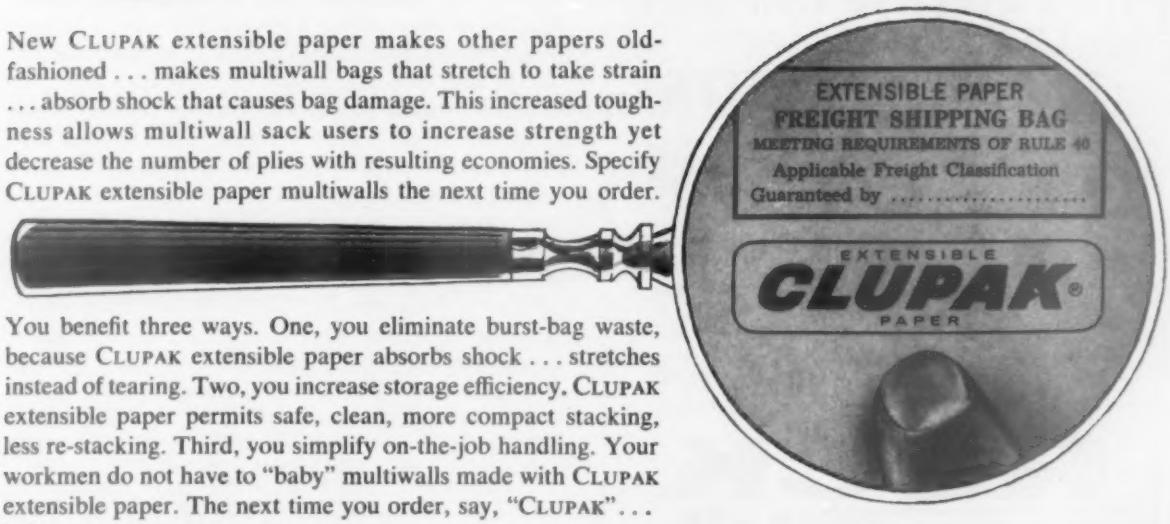
The ensuing study will be a comprehensive treatment of the job—economics, plant and operation and all other aspects of the problem. Result of the study is a recommendation for problem solution. It will justify one or more methods you may want to use.

Now you're ready to continue and complete discussions on the course of action to be fol-

Please turn to page 158

ELEMENTARY...IT'S A EXTENSIBLE CLUPAK® PAPER* MULTIWALL BAG ...THAT'S WHY IT WON'T BREAK!

New CLUPAK extensible paper makes other papers old-fashioned . . . makes multiwall bags that stretch to take strain . . . absorb shock that causes bag damage. This increased toughness allows multiwall sack users to increase strength yet decrease the number of plies with resulting economies. Specify CLUPAK extensible paper multiwalls the next time you order.



You benefit three ways. One, you eliminate burst-bag waste, because CLUPAK extensible paper absorbs shock . . . stretches instead of tearing. Two, you increase storage efficiency. CLUPAK extensible paper permits safe, clean, more compact stacking, less re-stacking. Third, you simplify on-the-job handling. Your workmen do not have to "baby" multiwalls made with CLUPAK extensible paper. The next time you order, say, "CLUPAK"... before you say paper.

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"ENGINEER" YOUR PROFITS

continued from page 156

lowed. After that, a contract for completion of the work may be made. It will include completion of detailed drawings and all specifications by the engineering firm to define the project for construction. Sometimes the contract will be of the "turnkey" variety.

How much does this service cost? A rule of thumb for cost of an individual consulting engineer is double the salary rate the individual normally receives. It's hard to say how much an engineering firm may charge, since it depends so much on the specifics entailed in each project, each of which is considered on an individual basis.

Some feel that the benefits derived through efficiency designed into the project may pay for itself out of profits. In any event, cost for any engineering job can be estimated closely before work is begun. In many cases, a firm price or maximum cost to a producer can be established beforehand.

To summarize, the aggregates industry needs to improve its profit position as the industry improves and progresses. Better operating efficiency can be gained through investment in modern machinery and processes. For best results, programs of plant rehabilitation or expansion should be engineered. Modern engineering counsel is available and should be used. **END**

DETAILS BUILD EFFICIENCY

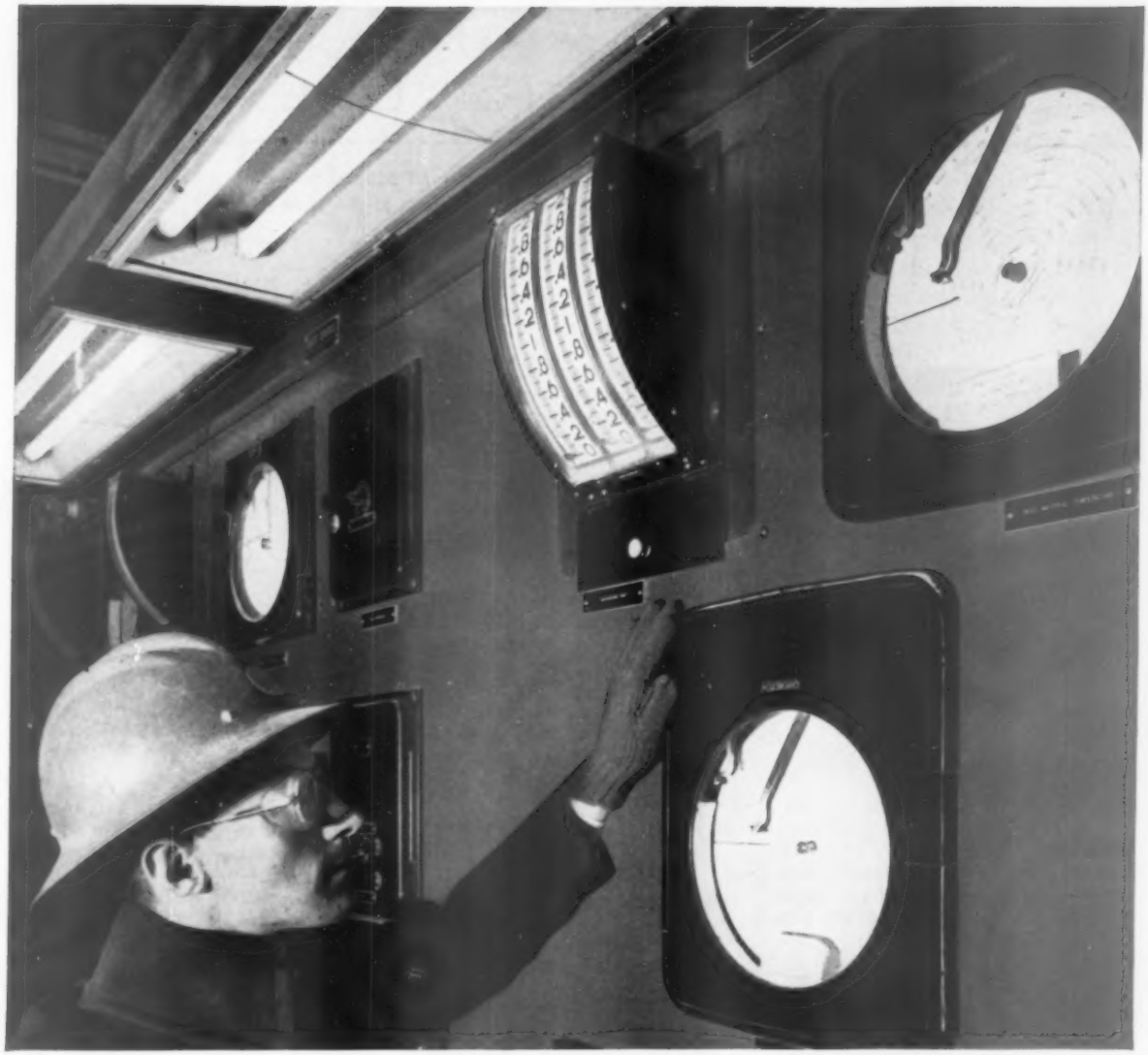
continued from page 124

"It wasn't worth it," he says. "I worked my head off shifting up and down while the other rig stayed in a lower gear. After a couple of hours, I hadn't moved much more dirt, but I sure had worked myself and that machine a lot harder."

Clean equipment also contributes to his over-all program. Each tractor carries a spade, and operators frequently stop to knock down a pile-up of dirt or foreign material, particularly from undercarriages. Keeping rocks and dirt away from the rollers, sprockets and idlers as much as possible does much to extend their service life, he finds.

Obert began the Colchester Stone Co. quarry work seven years ago on a 30-day trial, working on a per-hour, per-machine basis. His only production requirement is to stay ahead of the quarrying schedule, a requirement he has met admirably with a preventive maintenance program that pays attention to "the little things." **END**

MAJOR EQUIPMENT REFERENCE: Three D7 tractors and two No. 70 scrapers owned by A. G. Obert were manufactured by Caterpillar Tractor Co.



it's low-maintenance Foxboro Dynalog* Recorders at Universal Atlas Cement Division of U. S. Steel...

instruments have run continuously since 1953 with only occasional maintenance

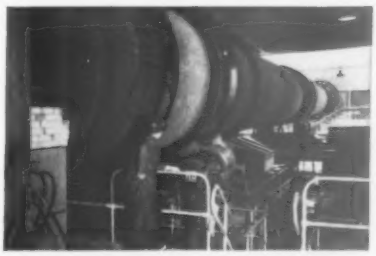
Kiln-gas, burning zone, mill air, dried material temperatures . . . Foxboro Dynalog Electronic Recorders chart them all at U. S. Steel Corporation's Universal Atlas Cement Division at Universal, Pa.

And in seven years of continuous, 24-hour-a-day, 7-day-a-week operation, Foxboro Dynalog Recorders have required no maintenance except occasional vacuum-tube replacement.

Low-maintenance is designed right into the Dynalog. There are no slidewires or other moving parts as found in conventional electronic recorders. Instead, a variable, radio-type capacitor with silent magnetic drive, gives stepless, continuous balancing; smoother, faster response without waste motion or wear!

For sustained high accuracy, and freedom of maintenance, investigate Foxboro Dynalog Recorders. They can be used for any electrical measurement . . . resistance, voltage, capacity.

Write for Bulletin 20-10 — it gives all the details. The Foxboro Company, 839 Neponset Ave., Foxboro, Massachusetts.



One of the two rotary kilns at Universal Atlas Cement Division, as seen from the firing platform. Each kiln is 360' long, 11' in diameter.

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FOXBORO

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NEW LITERATURE

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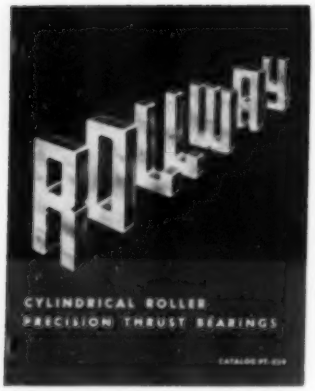

Thrust bearing catalog

ROLLWAY BEARING CO. has announced its new catalog of cylindrical roller precision thrust bearings. The catalog features detailed engineering data on the company's improved thrust bearings with an average of 30 percent greater load capacity, and a new line of thrust bearings with metric dimensions. Detailed information on dynamic and static bearing capacities, the company's patented tandem thrust bearings, new sizes of crane hook bearings, and bearing applications are contained in the 28-page publication.

The improved bearings feature retainers made of specially developed ferrous material known as Rollube. These retainers have a reduced tendency for surface "welding" between roller and retainer pocket under conditions of marginal lubrication and have wear-resistant properties against bearing steel. The thermal coefficient of expansion is approximately the same as the rollers and the thrust plates. Rollube weighs less than bronze and it is said to have 1½ times the yield strength of the conventional-type bronze retainer.

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Motor selector

HOWELL ELECTRIC MOTORS CO. has announced a new 8-page motor selector. It lists a reference to the complete motor and generator lines available through the consolidation of the company with Ohio Electric Mfg. Co., Kingston-Conley, Inc., and Leland Ohio Electric Co. Motors manufactured by the combined group range from 1/40 to 300 hp. They include a complete line of standard motors in a broad range of voltages, speeds, mountings and enclosures. A wide variety of special applications is available. Other motor designs listed are flat-type, multi-speed, part-winding, sanitary, torque, reversible, hose reel and shell type (shaftless and frameless). The brochure also lists horizontal-shaft and right-angle gearmotors, coupled-unit speed reducers, generaors, motor-generators, frequency changers and industrial bench grinders.

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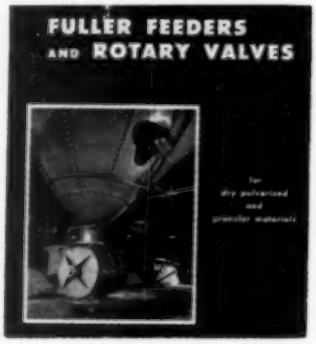
Feeders and rotary valves



FULLER CO. is now offering a new bulletin describing and illustrating its complete line of roll and vane-type feeders and rotary valves. The feeders, built of cast iron or iron and steel combinations, are designed to handle a large variety of dry pulverized and granular materials. The bulletin includes descriptions of the various types of feeders and lists materials handled by them. Photographs and drawings of different type feeders appear in the bulletin, and tables give key dimension and capacity figures.

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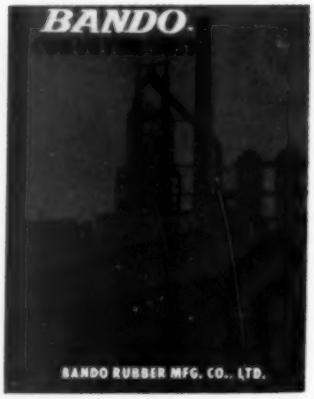

Conveyor belts

BANDO RUBBER MFG. CO., LTD. has released a catalog on its line of plastic fibre carcass conveyor belts. The illustrated catalog gives information on the types of conveyor belts, construction of conveyor belts, kinds of conveyor belts classification (according to use) and the designing of conveyor belts.

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Belt conveyor idlers

BARBER-GREENE CO. has produced a 44-page catalog on idlers for belt conveyors. This catalog covers idler application, and describes and illustrates the more than 800 units in the company's line. Features of four different series are discussed, and complete specifications and weights for each unit are listed. A section on idler selection shows how to choose the correct idler series and roll diameter for any belt conveyor system. A simple formula demonstrates an easy way to figure the number of idlers needed for a given installation, and a chart simplifies determining correct idler spacing. The catalog also presents tips on idler maintenance, including lubrication intervals. A section explains the company's conveyor standardization system, and illustrates and describes many of the components and accessories.

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(Continued on page 162)

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If you're thinking about **moving up,** think about the big SERIES TWO Bucyrus-Erie 71-B! Here's what you get: twin-governor, dual control of engines and torque converter — fine-line control of power and speed . . . different crawler mountings to fit your job conditions . . . a shovel or dragline front end that swings more payload, less dead load . . . diesel power as standard equipment (optional electric power available).

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71-B

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most respected name in the field

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NEW LITERATURE

(Continued from page 160)

"Handbook of Crushing"

PENNSYLVANIA CRUSHER DIV. of Bath Iron Works Corp. announces a new edition of its "Handbook of Crushing." The 40-page book has been prepared to provide a better understanding of the entire subject of mechanical size reduction. The various reduction methods—impact, attrition, shear and pressure—are described and discussed, as are the many kinds of crushing equipment. Closed circuit crushing systems are covered, as are the various factors to be considered in selecting crushing methods for particular applications and materials. The book is illustrated with diagrams and charts for easy understanding.

Enter 605 on Reader Card

Two-way radio bulletin

GENERAL ELECTRIC Communication Products Dept. has issued a new two-way radio bulletin showing communication equipment available from the company. It describes frequency allocations and the various combinations of two-way radio possible in each frequency. Also shown is the difference between tubed equipment and transistorized models. The publication contains sections covering amplifiers, portable hand-carried two-ways, desk-type base stations, floor-mounted units, selective-calling, antennas, microphones, remote control and pocket voice message receivers.

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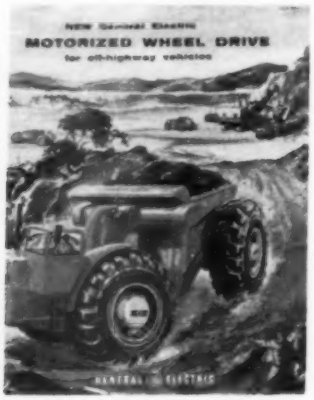
Motorized wheel drive



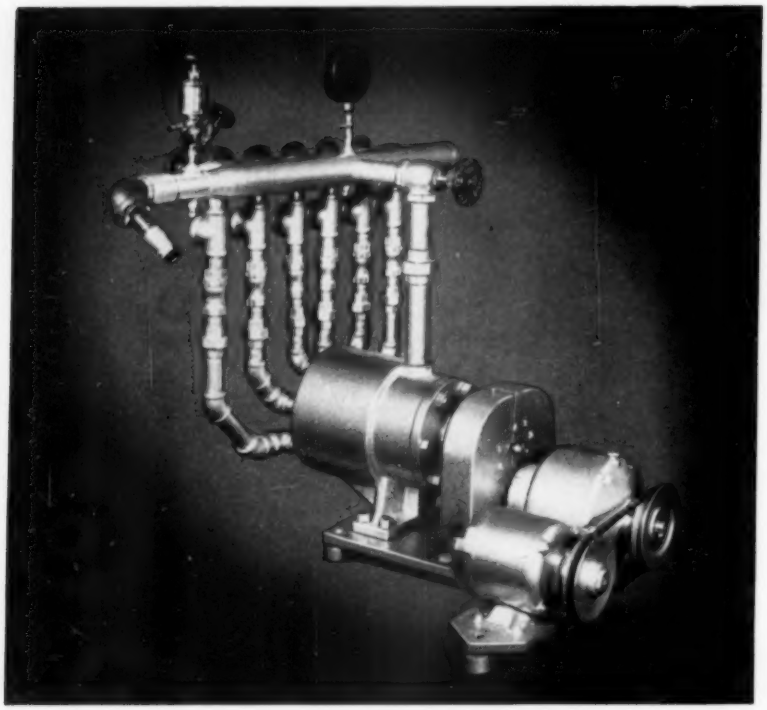
GENERAL ELECTRIC CO., Locomotive & Car Equipment Dept. has released a bulletin concerning the company's new motorized wheel drive for off-highway vehicles. This unusual wheel drive will add a new dimension to the field in that it is the first of its kind to be used. The illustrated brochure explains the unit's horsepower utilization, operation, all-wheel drive and proportioned power. Also covered are ventilation, controls and tire sizes of the wheel drive. Charts illustrate speed torque and speed braking effort limits.

Enter 607 on Reader Card

Hard rock drilling

GARDNER-DENVER CO. offers three sizes of the company's hard rock drills that are described in a new bulletin. Ranging from 4 to 6 in. diam., they are AM4, AM5 and AM6. The drills are designed and engineered for hard rock drilling in construction, quarry and mining operations. They screw directly onto your drill pipe and work at the bottom of the hole directly on the rock face. It is said that there is no power loss between the hammer and the bit, regardless of drilling depth. Hole cleaning is maintained by air through the air tube to the bit. Additional air is provided for cleaning from the drill exhaust pipe. With three mov-

(Continued on page 164)



MANITOWOC CENTRAL CONTROL VALVE

FOR SLURRY AGITATORS

The Manitowoc Central Control Valve is a self-contained, fast acting unit complete with air manifold and valve drive. Shown above is a motor-driven central control valve regulating air supply to six slurry agitators. It can be timed with great precision to suit any desired operating cycle and any electrical current characteristic. The entire unit is mounted on a common bed plate with driving mechanism fully enclosed and automatically lubricated.

The Manitowoc Slurry Agitator is designed to use air on an intermittent cycle—as supplied by the Central Control Valve—as economically as possible, and at the same time employs a unique method of piping that prevents the air line from plugging.

Get complete information on the Manitowoc Central Control Valve, Slurry Agitators and Recuperators for rotary kilns—write today!

MANITOWOC SHIPBUILDING, INC.

A subsidiary of The Manitowoc Company, Inc.

MANITOWOC, WISCONSIN

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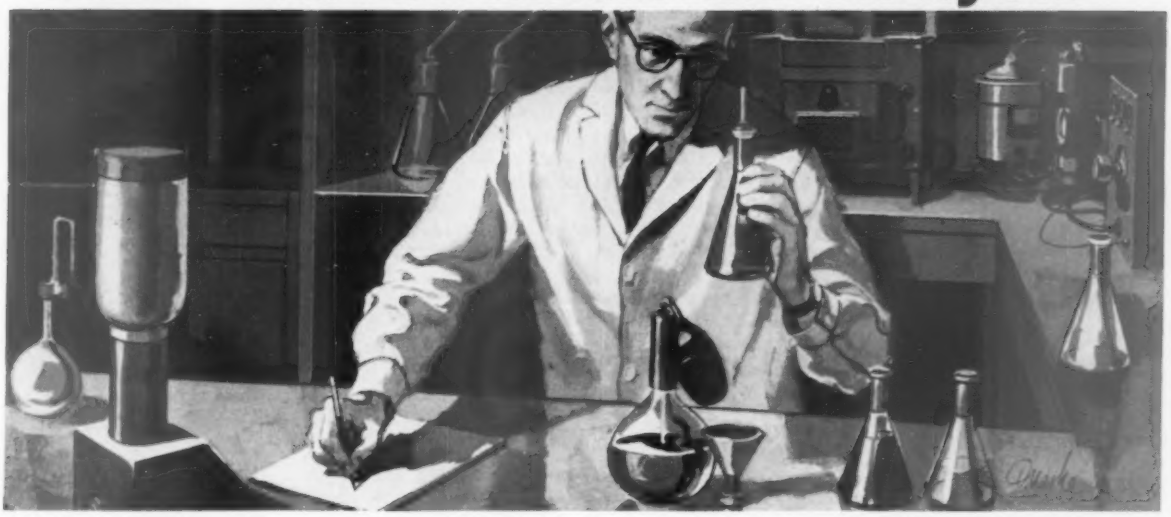
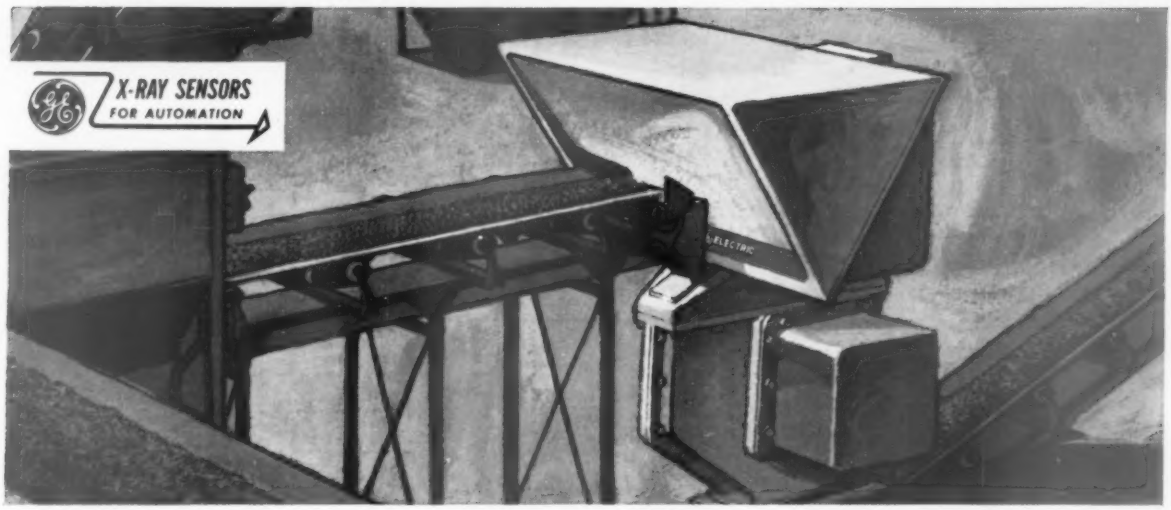
"XEG" moves materials analysis



out of the lab...



onto the line!

General Electric's revolutionary X-Ray Emission Gage offers what amounts to an "on-line" *laboratory* for quality control. XEG performs continuous analysis of solids, liquids, liquid mixtures, slurries, powders, sheets, rods, wire or similar materials *during actual production.* It monitors up to 5 selected elements . . . maintains *moment-by-moment* surveillance, sensing both presence and quantity.

Expressly intended for the production line, XEG also is suited to individual sample analysis. Operation requires no scientifically trained personnel . . . facts on composition are delivered automatically, instantly, for rapid-fire feedback to process control.

You'll find uses of XEG as unlimited as the imagination! Discover how you can take full advantage of this remarkable innovation — get complete information now from your local G-E representative. Or write to X-Ray Department, General Electric Company, Milwaukee 1, Wisconsin, Room RP-94.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Enter 1276 on Reader Card

(Continued from page 162)

ing parts: the valve, hammer and piston, there is easy disassembly.

Additional features include a backhead fitted with an action check valve for drilling in wet formations and an automatic drifter-type valve for short strike fast action. The cylinder is carburized for maximum resistance to abrasion. Straight hole drilling is possible due to the replaceable tappet bushing.

Enter 608 on Reader Card

"Successful Mining"

CATERPILLAR TRACTOR CO. describes efficient mine techniques and operations in a new 8-page, two-color booklet entitled "Successful Mining." The booklet describes uranium mining in Wyoming, iron and copper mining in Canada, copper waste disposal in Utah, chrome mining in Southern Rodesia and bauxite hauls in Arkansas. Use of crawler-mounted rippers to loosen deposits and overburden and the techniques of seismic analysis to determine rippability of materials are given special attention.

Enter 609 on Reader Card

New crane

THE THEW SHOVEL CO. has released a 12-page catalog covering their recently introduced 60-ton crane. One of the features discussed in the booklet is the company's outriggers that set up in about one minute. They are designed with curved beams with attached self-adjusting floats that move out and down simultaneously. Each beam is individually, hydraulically controlled from the carrier cab. Another feature included is the company's "ball bearing" design which connects the turntable to the carrier. Other items explained are the light, strong square-tubular-chord boom and removable counterweight. The booklet also shows pictures of the new crane in action.

Enter 610 on Reader Card

Rotary kiln design

VULCAN IRON WORKS INC. has just produced a 10-page brochure illustrating and describing in full all patented features of its new concept in rotary kiln design. A pilot model was built; it withstood all tests, and another unit is now operating successfully.

Enter 611 on Reader Card

END

WILLIAMS HoleMaker and K-Type bits are available in a wide range of tooth designs, in sizes from 2 15/16" to 7 7/8" inclusive, for either air or water drilling in any formation from soft to hard abrasive. These two world renowned bits deliver high penetration rate and maximum footage per bit for the most economical rotary drilling.
FASTER DRILLING BY
A GOOD BIT
WILLIAMS HoleMaker and K-Type bits guarantee uniform quality through the most modern heat treating of finest bit steels. Bearings are positioned in exacting machined races to assure smoothest running, freest cutting. All teeth are tungsten tipped. With a reputation for quality for over two generations, all materials and workmanship are fully guaranteed. Over 15,000 bits always in stock for prompt shipment.
Williams HoleMaker ROCK BITS
CONTACT
J & D BIT COMPANY
P. O. Box 608 SOMERSET, PA. Phone: 6819
ROTARY DRILLING EQUIPMENT, INC.
221 Olive St. SCRANTON, PA. Phone: Di. 4-8507
OR WRITE
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for nearest dealer and our latest catalog
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TELEPHONE: 143

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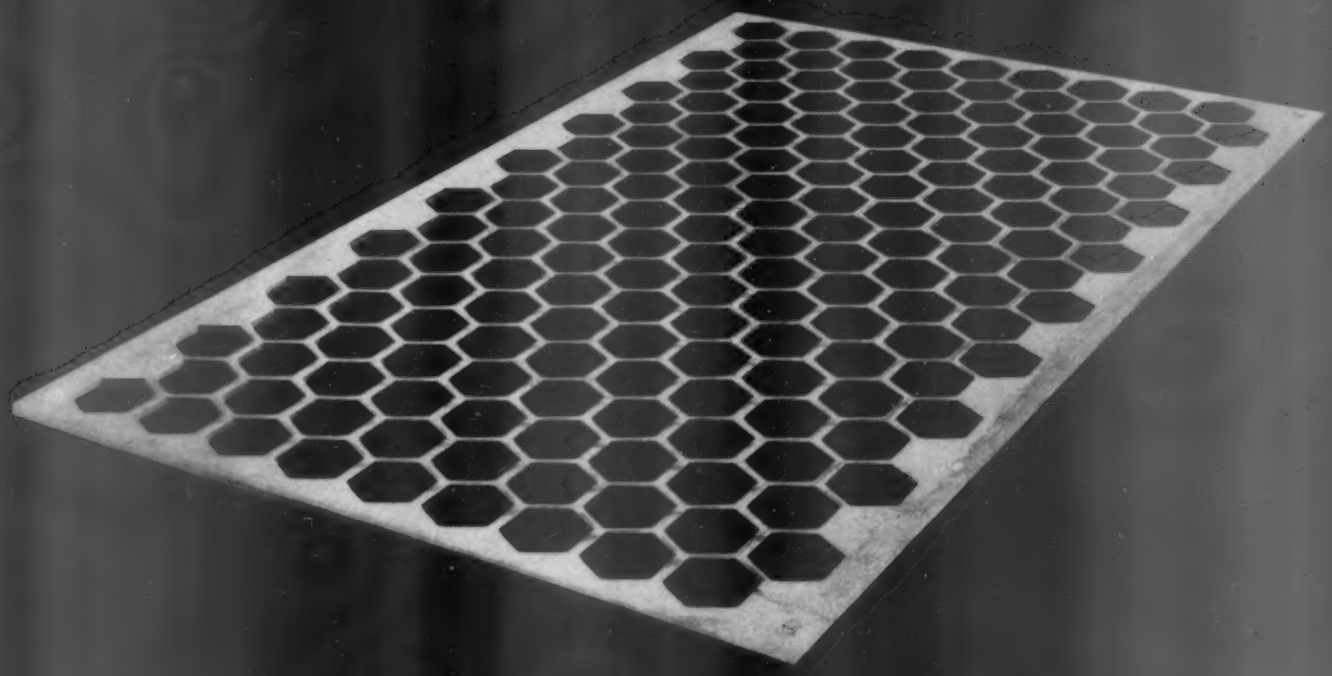


For rock products screening...

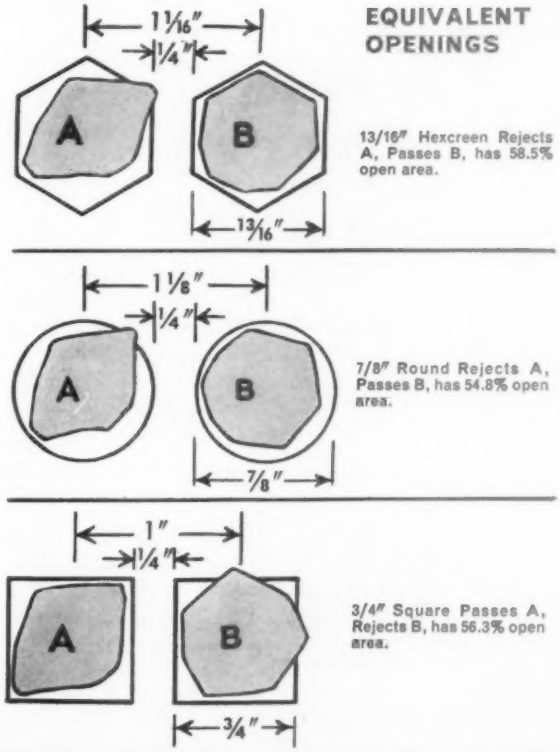
Cross HEXCREEN* gives more uniform sizing, greater capacity

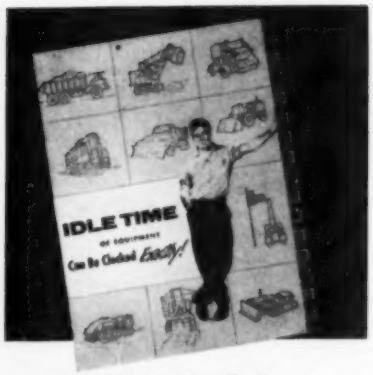
If you have been using woven wire screens or perforated metal screens with square or round openings, you will find that you can increase capacity, get more accurate sizing with CROSS HEXCREEN. The unique configuration of CROSS HEXCREEN (hexagonal shaped perforations), gives you more open area and less weight than equivalent square or round hole screens, yet provides the sizing accuracy of round type (see example at right).

CROSS HEXCREEN is specially designed for sizing granular products such as coal, coke, sand, gravel, crushed stone, slag, limestone, minerals and ores. CROSS perforated steel screens, made from long wearing CROSS Special Analysis Steel, are available in a wide range of sizes with uniformly spaced square, hexagon or round perforations, staggered for increased capacity and efficiency. For additional information on CROSS Perforated Screens write for complete catalog.

* T.M.

Cross Perforated Metals
NATIONAL-STANDARD COMPANY
Carbondale, Pa.





FREE Folder

tells how a $40 device

Measures Wasted Time

A tamperproof $40 instrument bolts to any shovel, grader, haul truck or other machine. It makes a minute-by-minute record of when equipment is busy and when it is idle. A glance at a chart tells you if scheduling and actual use of equipment is efficient. Known as a SERVIS RECORDER, 17 of these instruments saved one company $40,000 in a single year. Send for folder.

SERVICE RECORDER CO.

1015A Rockwell Ave., Cleveland 14, O.

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Achieve

M B E** with

Vibrations from Blasting Rock

by L. Don Leet

This thorough, up-to-the-minute guide provides you with the means of measuring the blasting efficiency of explosives. It details every aspect of vibrations caused by the detonation of explosives including:

- **Rock characteristics**
- **Blast preparation**
- **Detonation events**
- **Explosives**
- **Recording waves**
- **Damage structure**
- **Impedance ratios**

All this and more to assure you of

** **Maximum Blasting Efficiency**

Illustrated **$4.75**

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79 Garden Street, Cambridge 38, Mass.

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NEW PATENTS

by OLIVER S. NORTH

Clays

U. S. 2,928,751—In the preparation of a ceramic grade clay product of controlled and reproducible properties, the **kaolin** is fractionated at 2 microns, the coarser fraction heated at 1,112-1,832 deg. F. to cause maximum expansion of the kaolin "books," and then the two fractions are recombined in optimum proportions and thoroughly mixed. (to S. C. Lyons; assigned to Georgia Kaolin Co.)

U. S. 2,928,793—In a method for sulfating clay pellets used in the catalytic cracking of hydrocarbons, a compact mass of **kaolin** particles is passed through a series of treating zones where it is successively preheated, contacted with vaporous sulfur trioxide, contacted with a reducing gas, and steam treated. (to R. E. Ashwill and N. M. Knapp; assigned to Houdry Process Corp.)

U. S. 2,928,853—Use of titanium oxysulfate-impregnated **kaolin** catalyst pellets in the production of esters of low volatility by reaction of alcohols and acids each boiling above 212 deg. F. (to G. R. Bond, Jr.; assigned to Houdry Process Corp.)

U. S. 2,930,709—Use of **kaolin** in a composition for forming cores useful in the casting of steel in molds. (to C. G. Harman; assigned to Steel Founders' Society of America)

Fluorspar

U. S. 2,937,926—In a method for producing a plaster, suitable for use as a building material, from the byproduct calcium sulfate obtained during the production of hydrofluoric acid from **fluorspar** and sulfuric acid, the calcium sulfate sludge is treated with dry quick **lime.** (to H. Hanusch; assigned to Rofusa N. V.)

U. S. 2,937,990—A composition for extinguishing magnesium, sodium, potassium or lithium fires consists of a large proportion of pulverized **fluorspar** or common **salt** and small amounts of **fuller's earth** or **talc,** a copolymer of vinylidene chloride and acrylonitrile, magnesium stearate and tricalcium phosphate. (to W. R. Warnock; assigned to Ansul Chemical Co.)

Canadian 598,211—A composition for use in "submerged melt" electric welding consists of 8-12 percent ferrochromium, 2-4 percent ferromanganese, up to 8 percent **fluorspar** and the balance a slag-forming constituent. (to A. E. Shrubsall; assigned to Union Carbide & Carbon Corp.)

Canadian 598,232—In the flotation of **fluorspar, phosphate rock** and other non-sulfide ores, a foam is produced by introducing into the mineral pulp a mixture of pure oleic acid and a fatty acid alcohol sulfate containing 18 carbon atoms. (to H. Mottig; assigned to Klockner-Humboldt-Deutz A.G.)

British 833,098—Use of **fluorspar** in a non-exothermic alloy mixture for use in low-alloy steels during tapping. (to E. R. Saunders and R. L. Pope; assigned to Union Carbide Corp.)

Aggregates

U. S. 2,932,393—Improved process and apparatus for beneficiating raw **gravel,** whereby the hard stones are recovered continuously and the soft pieces are effectively rejected. The mixed material is impinged against a rigid, elastic inclined surface. The hard stones rebound beyond a predetermined range and are recovered, while the material having shorter rebound is recycled. (to E. H. Leslie)

Canadian 593,946—In a method for inhibiting the freezing of wet piles of **gravel, sand, crushed stone** and the like, the pile is treated with a mixture of common salt and an alkali metal iron cyanide. (to D. W. Kaufmann; assigned to International Salt Co.)

(Continued on page 173)

*Copies of United States patents are available at a cost of 25 cents each (photostat copies of foreign patents at 30 cents per page) from The Commissioner of Patents, Washington 25, D.C. For convenience, coupons, each good for one copy of any patent, may be purchased from that official at the rate of $5.00 per 20-coupon pad or $25.00 per 100-coupon pad.

TWO LORAINS TEAMED FOR TOP TONNAGE

At Orange Quarry Company, West Orange, New Jersey two Lorains speed quarrying of trap rock. One, fitted with a skullcracker, breaks up shot rock from a twenty-five foot quarry face. The other, a 2½-yard Lorain 85-A shovel keeps two 16-ton trucks on the run, averaging 1300 yards in an eight hour day.

In the pit, in the yard or wherever your toughest jobs are, the rugged Lorain 85-A has field proven features to deliver more payloads faster.

"Shear-Ball" for smooth, steady swing . . . less wear. Lorain's exclusive turntable connection requires no adjustment, and less lubrication than other designs. And "Shear-Ball" is warranted for ten years against failure to function under normal use and service.

"Joy-Stick" for fast control. Just two levers provide precision control through metered-air power. You can blend many operations into smooth flowing cycles, yet retain the normal feel of the machine.

Convertibility for workability. The 85-A converts easily in the field. And it has the power and control to pay off whether you use it as a hard digging shovel or hoe, or as a crane, dragline or clamshell. See your Lorain distributor.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN® ON THE MOVE

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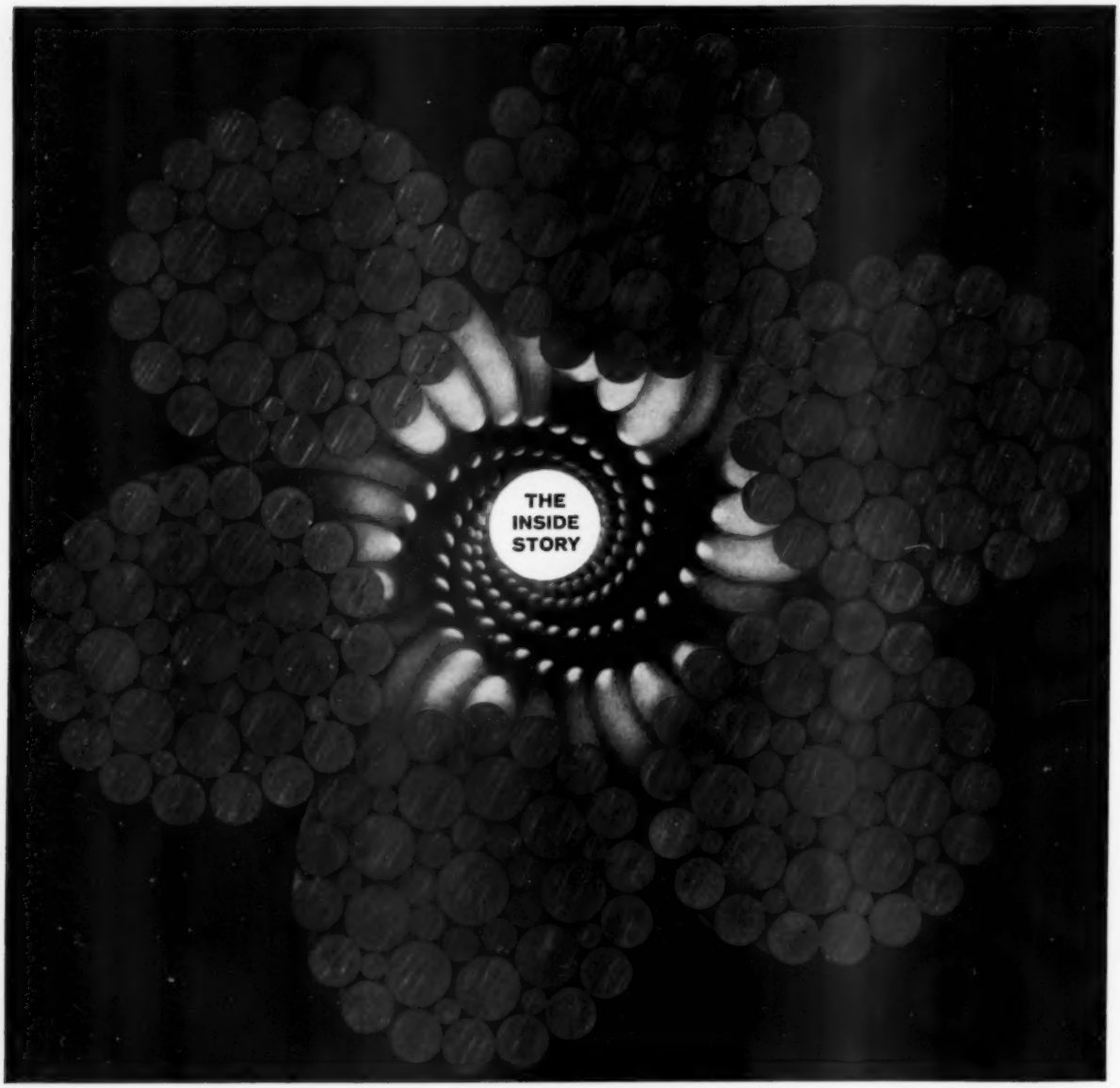

ROYAL BLUE—*we put a lot of work into it—You get a lot of work out of it.*

ROEBLING ROYAL BLUE WIRE ROPE This is rather a long view of a wire rope that's a real work horse. Time and tests have taught us at Roebling that wire rope users *want* the long view. What else, they say, are they spending their money for?

Here, you're looking through a length of Royal Blue whose core has been removed to show the uniformity and symmetry of the rope structure. You see how concerned we are with internal security.

This is one of the reasons why Royal Blue lives up to the day-to-day demands made upon it. High stresses and unavoidable overloads, abrasion, fatigue, impact, crushing, sheave pressures and abusive drum-winding, to name the major ones.

We have to know that the rope we build will do what we sell it to do. Numerous quality-control measures help us—as they do you—to take the long view of Royal Blue. For details about long-lasting Roebling Royal Blue, ask your wire rope distributor or write Roebling's Wire Rope Division, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities • John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation

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READER-SERVICE CARD

RP-9-60

ROCK PRODUCTS
79 W. Monroe St.

SEPTEMBER, 1960
Chicago 3, Illinois

Cannot be serviced after November 1, 1960 postmark.

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Company (In Full)_____

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Send information on items identified by key numbers beside or below items of interest to you. List your choice in numerical order. Limit 10 per card.

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MONEY-MAKING IDEAS FOR YOU - - - FREE

HOW TO USE THIS SERVICE

1. **Advertised Products**
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There is a wealth of valuable information in the manufacturers' booklets offered in this issue. For your convenience, each advertisement, each new machinery and new literature item has been given a key number. Simply fill in the proper key number in the appropriate space on the card above and send it to us. We'll do the rest.

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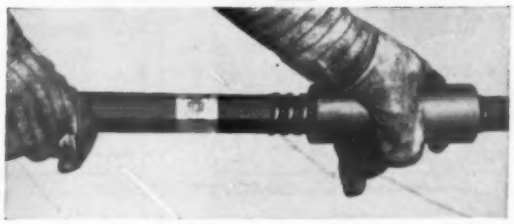
There is a wealth of valuable information in the manufacturers' booklets offered in this issue. For your convenience, each advertisement, each new machinery and new literature item has been given a key number. Simply fill in the proper key number in the appropriate space on the card above and send it to us. We'll do the rest.

Never before drill steel like this!

NEW GARDNER-DENVER *HI-LEED* STEEL

Drillers who have used this unique and revolutionary Gardner-Denver thread design are enthusiastic about its convenience and economy. Give it a try on your own rock drills—you'll soon see why. Call your Gardner-Denver drill steel specialist, or write for new bulletin on HI-LEED steel.

Only Gardner-Denver *HI-LEED* drill steel gives you all these field-proved advantages



ALWAYS UNCOUPLES BY HAND

New HI-LEED thread design makes wrenching unnecessary. Gardner-Denver engineers have incorporated field-proved reverse buttress design into an entirely new thread form that always uncouples by hand.

CUTS DRILLING TIME ON EVERY HOLE

HI-LEED steel saves time in adding rod . . . and ease of uncoupling, without use of wrenches, helps drill hole faster.

SENDS MORE IMPACT TO THE BIT

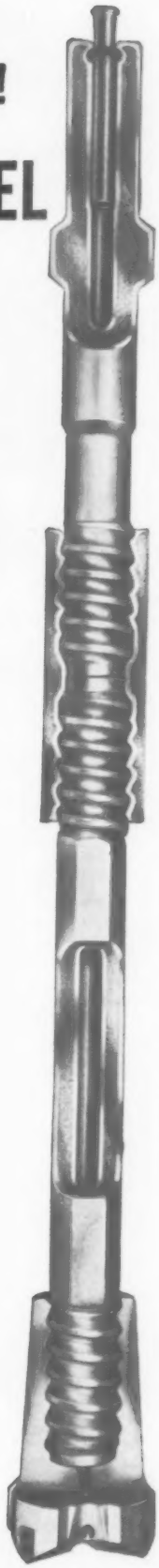
HI-LEED sectional steel transmits drill impact almost as well as a solid rod. That's because precision-milled threads on rod and coupling are in close contact over a large total area, thus holding rod ends firmly together.

DRILLS MORE FOOTAGE PER ROD

HI-LEED rods are designed to last longer than any other sectional steel, and the wide thread peak assures maximum wear. Carburizing and shot-peening give the steel a hard surface and tough inner core.

PREVENTS LOST HOLES

New HI-LEED design keeps mating parts snug—rods won't uncouple in the hole or while pulling out. Other thread forms may not hold a tight connection and many rod strings have been lost in the hole while pulling out with rotation on.



EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

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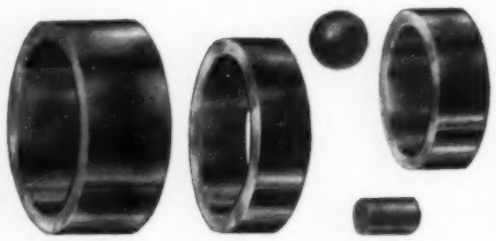
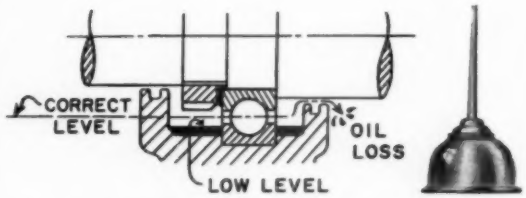
DISTRIBUTOR DAN, the SKF bearing man, tells

WHY BEARINGS BECOME OVERHEATED

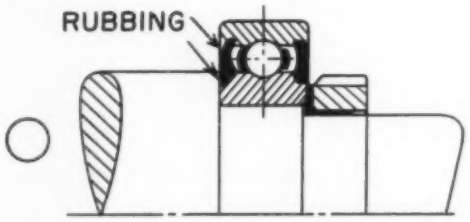
and how to correct the conditions that cause excessive heat.



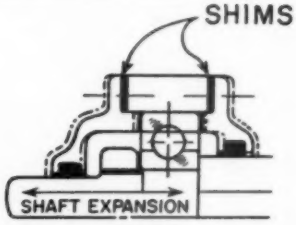
LOOK FOR THIS SYMPTOM. Discoloration of a bearing's rings, balls or rollers is a sure sign of overheating. The color is usually a gun-metal blue or bluish black.



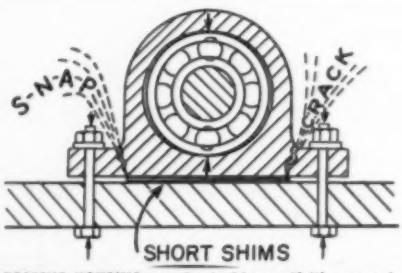
IMPROPER LUBRICATION OR LUBRICANT accounts for most cases of overheating. In pillow blocks, if oil is specified, fill only to the center of the lowest ball or roller in the bearing. If it's grease, the lower half of the pillow block should be filled. Therefore, be sure you're using the right lubricant—**in the proper quantity.**



RUBBING is a frequent culprit. Check the running clearance of the bearing seal. If it rubs against the shaft shoulder, re-machine the shoulder, to allow proper clearance. Bent lock-washer prongs are sometimes to blame. Straighten them or replace the washer.



EXTERNAL HEAT, conducted through the shaft, can make an inner ring expand excessively. It's usually the result of using a bearing with inadequate internal clearance. Make sure the replacement bearing is exactly the same as the original bearing. Should the markings be indistinct, consult an **Authorized SKF Distributor.**



THE BEARING HOUSING may be to blame—if it's warped or if the bore is distorted and out-of-round. Check to see whether the bore is pinching the bearing and relieve by scraping the bore. Make sure, too, that the pedestal surface is flat and that any shims cover the entire base area.

Baffled by a bearing problem? Whether it's selection, mounting, or maintenance—consult your Authorized SKF Distributor. He's staffed to help you keep them running smoothly and he stocks all the bearing types and sizes you need.

SKF

AUTHORIZED DISTRIBUTOR

6010

Spherical, Cylindrical, Ball, "Tyson" Tapered and REED Miniature Bearings

EVERY TYPE—EVERY USE

SKF®

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

*REG. U. S. PAT. OFF.

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(Continued from page 166)

Sylvinite

U. S. 2,936,887—Method for recovering the amine flotation reagent used in the production of a sylvite concentrate from ground **sylvinite** ore. The reagent-containing, partially dewatered slurry is contacted with an aqueous alkaline solution, such as sodium hydroxide brine, and heated to 180-220 deg. F. (to W. P. Wilson and T. M. Cramer; assigned to U. S. Borax & Chemical Corp.)

U. S. 2,937,751—In the "frothless" froth flotation recovery of coarse particles of sylvite from **sylvinite** ore, the ore is crushed, de-slimed, pulped with water and an aliphatic amine and then conditioned with a non-polar highly hydrophobic modifier. The pulp is then aerated, whereby the sylvite particles are caused to float on the surface of the brine in the absence of a froth bed. (to E. A. Schoeld, J. M. Fritschy and J. D. Nabors; assigned to Potash Co. of America)

Canadian 597,113—In the removal of sulfate salts from **sylvinite** ore, formation of glaserite is controlled by first determining the magnesium/sulfate ratio of the mother liquor and then regulating the sodium sulfate by dilution with water or by adding magnesium chloride. (to W. P. Wilson; assigned to U. S. Borax & Chemical Corp.)

Asbestos

U. S. 2,909,441—Use of **asbestos, talc** and **mica** in an asphaltene-plasticizer composition useful as a substitute for gilsonite-base insulating coating materials. (to M. W. Pickell; assigned to Kerr-McGee Oil Industries, Inc.)

2,910,250—Apparatus for simultaneously defiberizing **asbestos,** blending it with dry cement and blowing the dry mixture to a spray gun, where it is mixed with an adhesive and applied to surfaces. (to E. J. Fisher)

2,910,449—Use of **asbestos** fiber in a railway brake shoe composition. (to J. B. Evans; assigned to Westinghouse Air Brake Co.)

Canadian 596,975—Design for an improved electrode of the comb or point type for use in an electrostatic apparatus employed in the beneficiation of **asbestos** rock. (to W. Grogg, Jr., and M. P. Wineberg; assigned to Quaker Oats Co.)

(Continued on page 174)

Here is the SUPER-DUTY

Cape AnAlloy DROP BALL

for long-rugged service

FORGED and **HEAT TREATED** from abrasive resisting **ALLOY STEEL. Specifically** designed for rugged service. Economical, dependable secondary breakage! **SONIC TESTED** before shipment.

FULLY GUARANTEED!

"Cape Ann" will continue to offer its regular line of **FORGED** steel drop balls to those operators not requiring this Super Duty Drop Ball.

CAPE ANN
ANCHOR & FORGE CO.
P. O. Box 361
GLOUCESTER
MASS.

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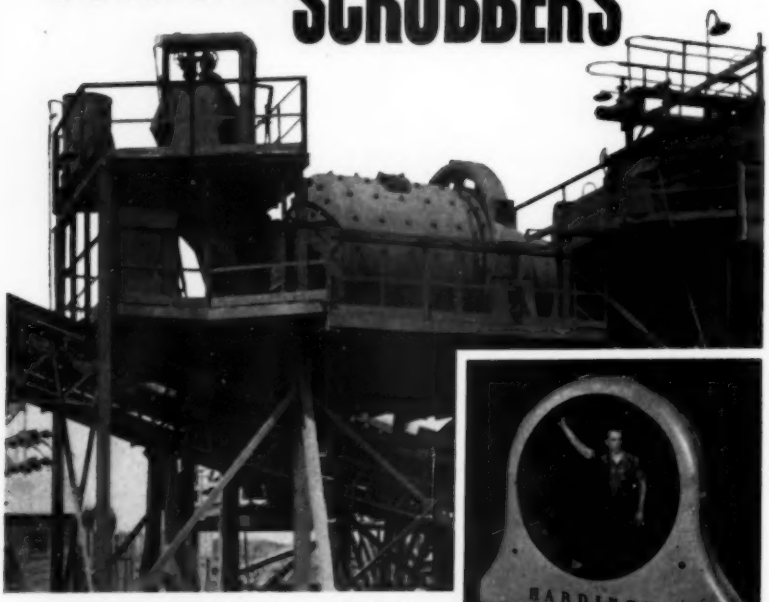
looking toward
IMPROVED PRODUCTION
... look to Hardinge !

The large diameter, short-length trunnions used on Hardinge Conical Scrubbers permit chute feeding of unsized ore and rock at rates up to 800 tons per hour. The superincumbent mass action of the charge quickly slurries the clay and dirt, permitting ready separation on washing screens or trommels.

Hardinge Scrubbers are in wide use in cleaning such diversified materials as limestone, phosphates, iron ore, river gravel, ganister rock, dolomite, abrasives, and in separating clay from rock and gravel.

HARDINGE
CONICAL SCRUBBERS



A 10' diameter by 84" long Hardinge Conical Scrubber scrubbing 3" iron ore.

A Hardinge Scrubber bearing—inside diameter 60".

Bulletin 37-B-7.

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COMPANY, INCORPORATED
Main Office and Works • 240 Arch St., York, Pa.
"Hardinge Equipment—Built Better to Last Longer."

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NEW PATENTS

(Continued from page 173)

Gilsonite

U.S. 2,919,239—This process for recovering a molten asphaltic product from aqueous slurries carrying solid particles of an asphaltite is particularly applicable to the recovery of **gilsonite** values from water slurries after transportation via pipeline. The slurry is heated to about 500 deg. F. under pressure to melt the gilsonite but prevent formation of vapor. (to M. Ludwig; assigned to Standard Oil Co. of California)

U.S. 2,920,029—To recover **gilsonite** values from an aqueous slurry, such as is transported via pipeline, the slurry is filtered and the gilsonite cake mixed with a small amount of oil. The mixture is then contacted with a hot heavy oil under optimum conditions to produce light oil vapors and gilsonite-heavy oil bottoms stream. (to L. P. Elliott and W. J. Rossi; assigned to California Research Corp.)

Canadian 587,280—An improved granulated bituminous material for insulating buried pipelines carrying relatively cool fluids consists of **gilsonite** particles graded and blended to meet critical size specifications. (to P. L. Morse; assigned to American Gilsonite Company)

U. S. 2,940,942—A fire retardant coating composition for application in a diluted state to wood comprises a blend of a small proportion of a fatty acid soap and about equal proportions of **gilsonite** and a finely divided mineral filler, preferably 300-mesh **talc** or a mixture of fine talc with exfoliated **vermiculite.** (to O. T. Hodnefield; one-half assigned to Kay O. Anderson)

Canadian 596,723—In the preparation of a composite liquid bituminous binder for use with aggregate in the making of road paving materials, a non-volatile bituminous flux oil is mixed with a solvent and a powdered bitumen such as **gilsonite.** (to G. B. Mollring)

Gypsum

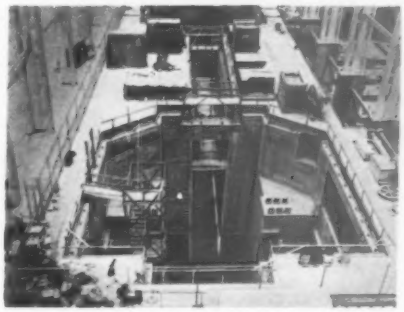
U. S. 2,940,505—In the production of **gypsum** plasterboard, a thin layer of plaster is applied to the core side of the paper liner sheets before the liner paper is applied to the core. (to W. M. Brothers; assigned to British Plaster Board Ltd.)

(Continued on page 176)

Dundee Cement Company, Dundee, Mich. Recently completed by Darin & Armstrong. Has annual capacity of 6 million barrels, features concentration of machinery and equipment in small area.

Radio Telescope, Greenbank, West Va. Now under construction, this reinforced concrete structure requiring 3000 cubic yards of concrete, will support a 140-ft. telescope weighing 1500 tons.

Press Foundation, Newark, Ohio. This foundation and pump pit was designed for mounting 25,000- and 35,000-ton presses. It is 190 ft. long, 68 ft. deep, and contains about 20,000 cubic yards of concrete.



CEMENT and Darin & Armstrong

Parking Facility, Detroit, Mich. Built in just 7 months by Darin & Armstrong for Henry Ford Hospital. Unique use of curved concrete panels is functional as well as strikingly attractive. 4 stories—870-car capacity.

We build the plants that make it . . . we use it every day

For your next construction contract, why not investigate the vast experience of Darin & Armstrong in all types of industrial projects?

Our organization, trained in diversified construction, has recently completed projects requiring tremendous amounts of cement, all types of steel construction, as well as heavy machinery installations in many different industries.

Some of our work is shown here. We'd like to talk to you about *your* next job. General construction, machinery installation —*or both*. Cost-plus or firm price.

DARIN & ARMSTRONG, INC.

GENERAL CONTRACTORS

Chicago 38, Ill. DETROIT 38, MICH. Cincinnati 15, Ohio

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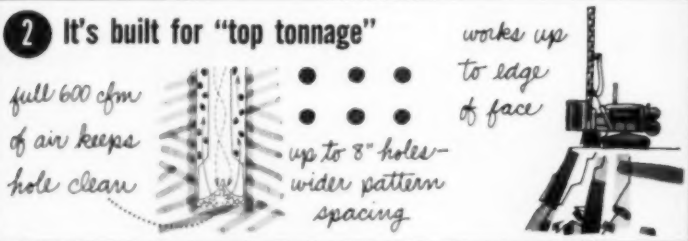
NEW SCHRAMM C-66 CRAWLER ROTADRILL
SLASHES COSTS, SPEEDS YOUR BIG JOBS

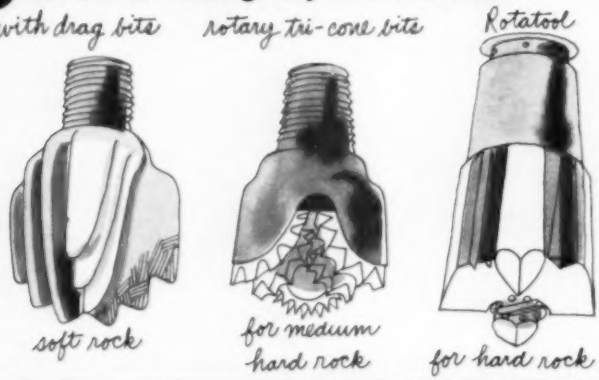
1 It's a completely self-contained "big rig"

extra pipes in the "Lazy-Suzan" rack
full hydraulic operation — air used only to clean hole
moves with mast raised
all controls in cab
one man operation!
curtain-type dust diverter

2 It's built for "top tonnage"



3 You can drill through any kind of material



Get the full story of how the Schramm Model C-66 Rotadrill can cut your tonnage costs. Write for full information and the name of your nearest dealer.

Schramm ROTADRILLS and ROTATOOLS

645 North Garfield Ave., West Chester, Pa.

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NEW PATENTS

(Continued from page 174)

Australian 224,409 — Method for forming cored **gypsum** tile and like structural units made from gypsum plaster. (to G. R. Franz and C. L. Austin; assigned to Cellular Walls Pty.)

U. S. 2,925,350—A composition for stopping leaks in pipes and plumbing fittings consists of paraffin, beeswax, **portland cement, gypsum** casting plaster and lampblack. (to G. F. Moore)

Canadian 591,906—Use of **gypsum** plaster in the making of spacers to be used between explosive charges in blastholes in quarries and mines. (to J. G. Canie; assigned to United Supply (Timmins) Ltd.)

British 825,874—In the manufacture of **gypsum** wallboard, a mechanical method is provided for "pairing" the boards prior to grinding off the edges and packaging. (to P. G. Cambray; assigned to Imperial Chemical Industries, Ltd.)

Graphite

U. S. 2,914,383—To remove silica, pyrite and other impurities therefrom, natural **graphite** is reacted with chlorine gas in the presence of a solid catalyst, e.g. CCl, or NaCl, thereby volatilizing the impurities so they can be removed in gaseous form. (to H. Ulrich; assigned to Graphitwerk-Kropfmuhl-A.G.)

Mineral wool

British 822,528—Method and apparatus for producing **mineral wool** mats. The linear speed of the conveyor is dependent on the power consumed by the spinning machine, so that the layer of fiber built up on the conveyor will be of uniform density. (assigned to Rockwool Aktiebolaget)

Mica

U. S. 2,926,829—A coating composition for application to the inside surfaces of fiberboard containers consists of an aqueous emulsion of silicone solids and **graphite,** muscovite **mica** or minus 2-micron **kaolin.** (to C. W. Wilkins; assigned to Owens-Illinois Glass Company)

END

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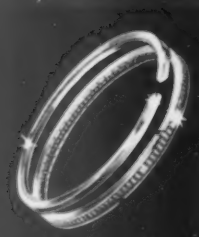


PERFECT CIRCLE PISTON RINGS ARE BUILT TO TAKE IT

HOTTER THAN A BLOWTORCH

The searing heat that's created inside engine cylinders causes inferior piston rings to lose their strength and resilience, and wear out far before their time. That's why Perfect Circle employs special metallurgical skills to produce ring materials that have the high heat stability needed for long life.

Extra-thick, solid chrome plating adds greater protection against scuffing. And, special alloys and heat treating deliver extra-high heat resistance for critical applications.

Whatever the job, Perfect Circle rings are built to take it. Insist on Perfect Circles—first choice of leading engine manufacturers and mechanics everywhere.

PERFECT CIRCLE

PISTON RINGS · PRECISION CASTINGS · POWER SERVICE PRODUCTS · SPEEDOSTAT

HAGERSTOWN, INDIANA · DON MILLS, ONTARIO, CANADA

NEW MACHINERY

FOR FREE INFORMATION on these items, simply fill out and mail postage-paid Reader Service Card found elsewhere in this issue

Dragline bucket control

Dual Hitch is claimed to be one of the most outstanding developments in dragline digging equipment. When used with the maker's line of 4-cu. yd. and larger buckets, it will give the operator control of digging depth. This will assure that the bucket will have the same loading of material at every pass.

The adjustment can be changed in a matter of minutes to permit digging at any desired depth above or below the fairlead with the same degree of efficiency and capacity. This new device can be applied to new buckets or, by factory installation, to the maker's older buckets. (Page Engineering Co., Clearing P.O., Chicago 38, Ill.)

Enter 200 on Reader Card

Packaged compressor

The units in a new line of two-stage, multivane fixed compressors come ready to mount on a foundation. Only air and water connections and an electric motor, engine or turbine need to be added at the time of installation. The assembly includes an integral overhead intercooler and a baseplate.

Capacities are available in a range between 279 to 3,300 cfm. of compressed air up to 125 psig. The small number of moving parts in the unit assures smooth flow of air with no vibration, according to the maker, and greatly reduces maintenance time. (Fuller Co., 124 Bridge St., Catasauqua, Pa.)

Enter 201 on Reader Card

Shirt-pocket radio

Here's another tool for communications-conscious rock products producers. The Voice Director is a 12-oz. all-transistorized, message radio that fits easily into a pocket. A tiny, powerful horn clips to the wearer's lapel or collar. The person wearing the equipment can receive messages from a base-station transmitter, a two-way car or truck radio or from a portable transmitter operating on the same frequency. Initially, frequencies in the 150 to 174-mc. range will be used.

The compact case includes a ferrite loop-stick antenna, a 6½-v. single mercury battery and flush-mounted volume and squelch controls. An optional ear piece is available for those who insist on absolute privacy. (General Electric Co., Lynchburg, Virginia)

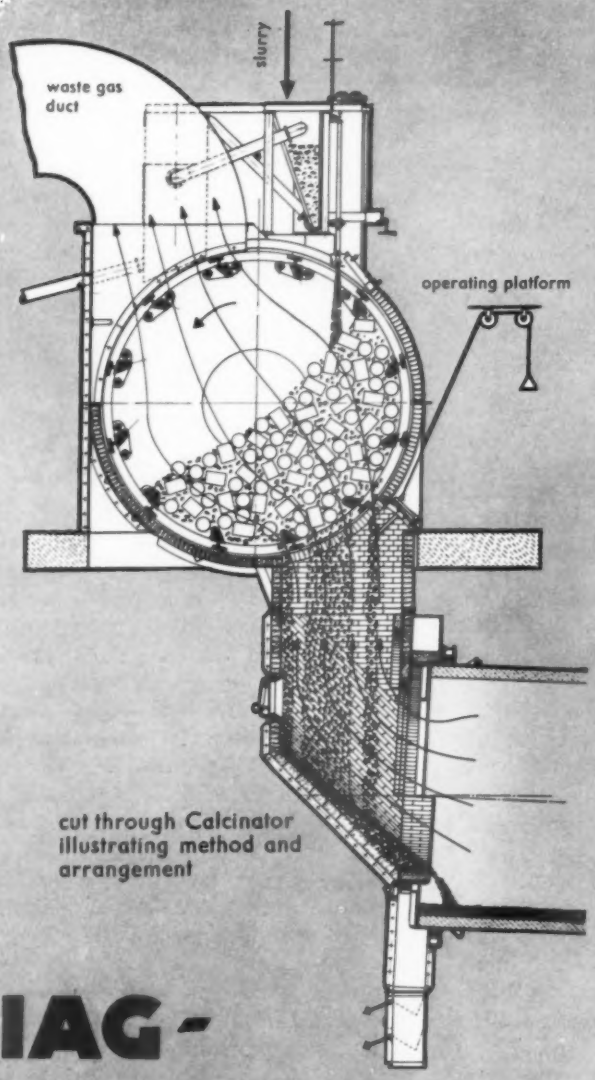
Enter 202 on Reader Card

Haulage truck improvement

Up to two tons more payload can be hauled in a newly designed corrugated steel truck body. In addition to the prime advantage of weight reduction, the new body is stronger. The maker states that it has greatly improved rigidity and durability over conventional design. The lower weight permits faster movement of the empty truck with greater fuel economy. (KW-Dart Truck Co., Kansas City 41, Missouri)

Enter 203 on Reader Card

Please turn to page 180



cut through Calcinator illustrating method and arrangement

Calcinator Installation for 7200 bbl/day

Calcinator for a wet process 3600 bbl kiln pre-assembled in factory

MIAG-CALCINATOR

the pre-heater for wet process kilns reduces fuel consumption, increases capacity

Grate drum of Calcinator for 3600 bbl capacity being assembled

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BRAUNSCHWEIG (Western Germany)

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MONTREAL, P. Q.

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Ultrasonic flowmeter

High-intensity sound waves have been harnessed to measure the rate of flow of water and other liquids in a pipeline. The use of ultrasound permits liquids to be metered without restricting flow through the line. For pipes larger than 2 in. diam. the only requirement is a short, specially-machined section of pipe on which to mount the unit.

A pizoelectric ceramic transducer sends an ultrasonic beam of predetermined frequency across the stream of fluid. The movement of liquid deflects the sonic beam and the signal is picked up by one of the two crystals on either side of the beam. The ratio of these signals is linear with flow. A meter readout, direct writing recorder or an integrator and mechanical totalizer are available.

The equipment has not yet been developed to the point where cement-making slurries and other solid suspensions can be measured accurately. However, the makers consider this to be a practical problem and are proceeding to adapt their new equipment for it. (Gulton Industries, Inc., 212 Durham Ave., Metuchen, N.J.)

Enter 204 on Reader Card

Transport truck

Structural aluminum alloys have been used to build a truck body for highway haulage. The 10,900-lb. tri-axle trailer can handle up to 50,000 lb. of payload.

The three-axle suspension with 12 tires keeps the unit within allowable axle weights and maximum allowable gross weights in Ohio, Michigan and Illinois. The all-aluminum frame and all-aluminum, 34-cu. yd. body permits up to 5 tons more payload than conventional steel construction, according to the maker. Dumping is achieved with a 9-in. diam., 22-ft. stroke commercial air cylinder. (Ravens Metal Products, Inc., Parkersburg, W. Virginia)

Enter 205 on Reader Card

Variable-speed pulley

This manufacturer's line of variable-speed pulleys has been extended to offer two heavy-duty units. The new spring-loaded, motion-control type sheaves are now available in 10 and 15-hp. units rated at 1,750-rpm. input and maximum pitch diam. of 10 in.

The new MS sheaves are said to need less space than any other unit of similar design. They are designed for use with angled motor bases and V-groove companion sheaves to provide a V to V drive of great efficiency. Under normal operating conditions the new sheaves will operate without additional lubrication for periods of six months or more. They will operate indefinitely at one speed without freezing at that ratio. (T. B. Wood's Sons Co., Chambersburg, Pa.)

Enter 206 on Reader Card

Plate magnet

A new, general-purpose plate magnet offers exceptional holding power and promises to be the solution for many difficult problems of controlling tramp iron and magnetic fines. The new magnet provides an opportunity to protect crushers, screens, conveyors and other machinery from bolts, spikes, wire and other dangerous steel or iron parts. At the same time, finished products—silica, plaster, cement or sand—can be protected from iron contamination.

The superior magnetic power of the new Series 16 magnet is derived from a specially designed and energized Ceramic V magnetic material. This permits more intense concentration of magnetic strength near the surface of the compact plate, according to the manufacturer.

Enclosed in all-welded, stainless steel case, the magnet can be readily installed in chutes, spouts or hoppers or placed over screens or conveyors. (Eriez Mfg. Co., Erie 6, Pa.)

Enter 207 on Reader Card

Ball mill drive

Twinducer is the name of a dual motor drive arrangement for ball and rod mills. The new drive divides the load between two synchronous motors. Once the load has been balanced between the two motors, no further adjustment is said to be necessary. Prime advantage of the new setup is the great reduction in space achieved by the use of two small motors rather than one large one. In addition, it permits more power to be applied to ball mills without increasing the space needed for the drive. (Allis-Chalmers Mfg. Co., Milwaukee, Wis.)

Enter 208 on Reader Card

Please turn to page 182

KEEP MINING ON THE MOVE

With This NAYLOR *Combination*

The NAYLOR Wedgelock coupling makes a positive connection, securely anchored in standard weight grooved ends.

Mining engineers looking for ways to save time, work and money will go for the performance of NAYLOR Spiralweld pipe and NAYLOR Wedgelock couplings.

NAYLOR pipe is light in weight, so it's easier to handle and install—whether you suspend it, support it, string it along the surface, or bury it.

The distinctive lockseamed-spiralwelded structure gives you pipe that is extra strong and safe in service.

The NAYLOR Wedgelock coupling helps, too, because it is designed for faster, easier and more economical connections. A hammer is the only tool required to connect or disconnect it.

It will pay you to look into this NAYLOR combination for your air, water, tailings and ventilating lines. Write for Bulletin No. 59.

NAYLOR PIPE *Company*

1237 East 92nd Street, Chicago 19, Illinois

Eastern U.S. and Foreign Sales Office
60 East 42nd Street, New York 17, N. Y.

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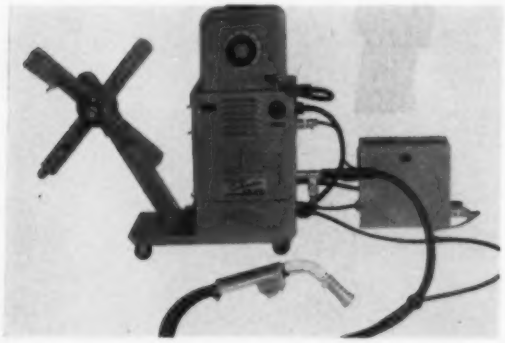


Spot welder

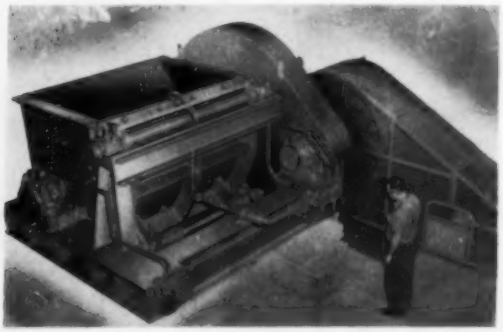
Spot welds can be made at a rate up to 20 per min. with a newly developed inert-gas shielded-arc unit. This offers the opportunity to weld stainless steel, aluminum, galvanized steel as well as ordinary carbon steel. The unit can make plug welds and tack welds in addition to regular bead welding.

Commercially available inert gases are used—carbon dioxide, argon or helimum—depending on the application. Weld spatter is held to a minimum, according to the maker, and weld cleaning is usually unnecessary.

The entire assembly includes a welding "gun" that controls the flow of gas and shields the weld. Duration of the arc is controlled by a portable timer that has a reel of welding wire to be fed to the gun at a constant rate. (Hobart Bros. Co., Troy, Ohio)

Enter 209 on Reader Card

Single-roll crushers



A new line of single-roll crushers features high capacity, low headroom and fabricated steel crusher housing. Known as the Hercules, the new line has 11 standard sizes between 24 x 30 in. and 36 x 72 in.

The new units are offered for heavy-duty primary or secondary crushing, making them suitable for preparing cement rock, aggregates or agricultural limestone. But the line is also useful for fast, efficient crushing of gypsum, shales, slate and slag. (Pennsylvania Crusher Div., Bath Iron Works Corp., West Chester, Pa.)

Enter 210 on Reader Card

Long portable conveyors

Portable belt conveyors are now available in exceptional lengths. The new PA-80 Series is offered in 69, 75 and 81-ft. long conveyors, in standard belt widths of 18, 24, 30 and 36 in. These lengths make it easy to build deeper stockpiles, while the pneumatic tires and swivel wheels make it possible to use the units as radial stackers. Despite their great size, the new conveyors are easily towed. (Barber-Greene Co., 400 N. Highland Ave., Aurora, Illinois)

Enter 211 on Reader Card

Truck transmission

A new heavy-duty transmission is in production and will be available on the trucks of a number of manufacturers. The CLBT-5940 unit is offered for use with diesel engines up to 525 hp., and the capacity of the three-element torque converter is claimed to be the highest of any 17-in. model on the market. Stall torque ratio of the converter is 2½ to 1.

A torqumatic brake is an option on the new transmission. With an "autoflow" cooler circuit, the rate of flow of cooling oil is increased. This will make it possible to use the full brake for longer periods. (Allison Div., GMC, Indianapolis, Ind.)

Enter 212 on Reader Card

Conveyor safety switch

A pull-cord type safety switch offers greater safety around belt conveyor installations. The Jabco Belt Switch operates from either or both directions and has one On and two Off positions. Unusual is the safety feature that requires two pulls on the cord to restart the conveyor once it has been stopped.

The installation of pull cords can be designed to operate as a remote control device for belt conveyors or to respond to an overflow of coarse rock or gravel anywhere along the length of the conveyor.

Additional features of the new safety switch include a sheet metal housing to mount the device on a conveyor frame or panel board, a lever for manual setting of the switch and a lockout clip to hold the lever in off position during maintenance. (Schroeder Bros. Corp., P.O. Box 72, McKees Rocks, Pa.)

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END

Quaker Thermoid

WATER SUCTION HOSE

Built to deliver whatever you can pump!

Sharp sand . . . silt . . . mud . . . small rocks . . . even ice. That's what puts the wear on hose. And with today's high-speed pumps the abrasive action multiplies.

Thermoid-Quaker Water Suction Hose is *triple-tough*. It's sturdy enough to meet the roughest, toughest, on-the-job wear. Yet it's light-weight and flexible, easy to carry, easy to set in place.

This triple-toughness is the result of three specially-designed layers. First, a black, rubber tube that resists mild acids and alkaline water . . . and abrasion. Second, a strong, durable carcass of heavy cotton fabric and heavy-gauge, copper-coated spiral steel wire that resists kinking and crushing. Third, a black, rubber cover that stands up under the toughest treatment . . . combats exterior abrasion . . . withstands exposure to sunlight and rough weather.

Ask your Thermoid Division Distributor about this triple-tough hose. It comes in sizes and constructions for every pumping requirement, in 50-foot maximum lengths. Or write *Thermoid Division, H. K. Porter Company, Inc., 200 Whitehead Road, Trenton 6, New Jersey.*

THERMOID DIVISION **PORTER** H.K.PORTER COMPANY, INC.

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

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MANUFACTURERS NEWS

New pulverizing system now in operation at Bradley

TESTING, PILOT PLANT and modified production have been combined in a new size reduction system in operation at Bradley Pulverizer Co.'s Allentown, Pa., plant. This is a pneumatic-type roller mill pulverizing system originally developed for test grinding of unusual materials. The company has added this model to its line as a production unit as well as for test purposes. The system will remain in operation at the Bradley plant where any material can be shipped for test runs without charge. In order to run a true test, a minimum of two tons of material are required. Material should be ⅜ in. and down, with moisture content not in excess of two percent. Preferably, the material should be shipped in steel drums so that the finished product can be returned in the same containers. This system will handle any material normally pulverized in the larger units.

The system consists of a raw material elevator and raw material feed bin to the mill itself, which has a 33-in. diam. die ring, 6½ in. high, and is equipped with two or three rolls depending on the product to be ground. When the material has been ground to the desired fineness, it is picked up by the air stream and carried to a cyclone collector where the ground material is separated from the air stream. The air is returned through the mill system. Ground material drops from the cyclone collector into a finished material bin. This system when in operation is dustless.

The present unit, although not equipped for drying, can have a drying unit added to the system to handle products up to 10 percent moisture.

Bulk cargo vessel loads and unloads by conveyor

A NEW KIND OF BULK CARGO vessel, the S.S. Martha Mac, which can load and unload by conveyor without the aid of port or dock facilities is now operating in the Gulf of Mexico. The vessel is designed to discharge or pick up bulk materials at a rate of 2,800 tph. from or to other vessels or shore storage piles.

The equipment which makes this method of material handling possible was designed by Hewitt-Robins, Inc., manufacturer of material handling systems. It consists of a "closed circuit" 54-in. wide conveyor system circling the top deck, two traveling track hoppers with belt feeders, two traveling swinging tripper-boom stackers (one on each side) fitted with telescoping delivery chutes, and two revolving electric cranes equipped with clamshell buckets with a capacity of 9½ cu. yd. Owned by the Gulfcoast Transit Co., the vessel is a converted T-2 type oil tanker.

Chain Belt appoints three

THE APPOINTMENT OF G. H. Pfeifer as director of product merchandising and public relations has been announced by Chain Belt Co., Milwaukee, Wisc. His appointment heads changes in the company's marketing staff in which Jack Heaps becomes sales promotion manager of the construction machinery section and Robert F. Olson becomes sales promotion manager of the industrial section.

Mr. Pfeifer joined the company in 1933. Mr. Heaps started at Chain Belt in 1948, and Mr. Olson joined the company's Shafer Bearing division at Downers Grove, Ill., in 1948.

Varel opens Algerian plant

MR. D. W. VAREL, president of Varel Mfg. Co., Dallas, Texas, announced the letting of the contract for a $100,000 plant in Rouiba, Algeria, for the manufacture of rock bits to be known as Varel Afrique. Varel is the first American manufacturer to be granted a permit to operate in this area. The Algerian plant will operate on the same basis as the home plant in Dallas. It will include a modern heat treat plant as well as complete machining facilities for the manufacture of rock bits.

(Continued on page 186)

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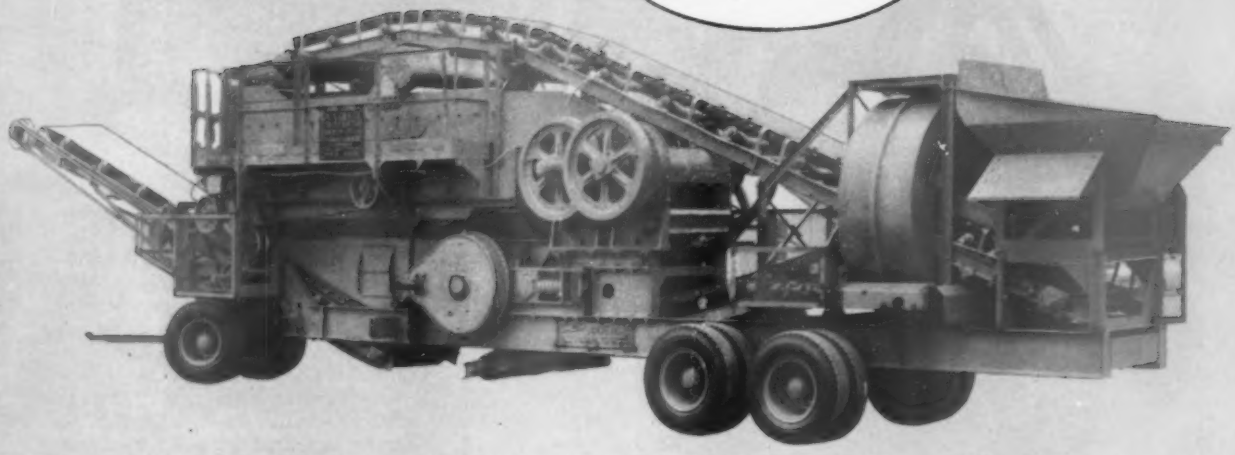
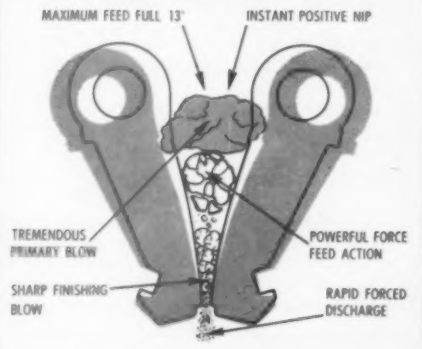
another
UNIVERSAL SYSTEMIZED
plant



Universal's new Giant Gravelmaster is systemized to handle BIGGER PRIMARY CAPACITY



BIG PRIMARY CAPACITY WITH UNIVERSAL'S NEW MATCHED JAW

Feeds faster, crushes faster, discharges faster. Synchronized Matched Jaws move at high speed, are longer, nip instantly, crush without belching or rebounding, force feed as they crush for bigger primary crushing capacity.

Universal's systemized engineering gives you a new Giant Gravelmaster plant with all components carefully balanced to keep up with the tremendous output of the new Matched Jaw Primary Crusher. These jaws with their high velocity, dual crushing action force material through discharge in tremendous volume. They crush closer to final product sizes — cut down on re-circulating loads, take pressure off secondary equipment.

Big Universal Roll Crusher gives you the greatest secondary crushing capacity ever offered in a plant of this type.

It's 30″ x 26″, with feed designed to make full use of 26″ rolls — gives you top crushing output even in pits with high percentage of secondary material.

Snappy, Aggressive Screening that quickly cuts wet or damp material, prevents blinding or blanketing, and produces tremendous volumes of graded material at lower cost is a feature of the Screenmaster Horizontal Screen. The Screenmaster's exclusive air springs and rubber bushed phasing bars are responsible for its snappy controlled action and high volume screening.

Fast-moving extra wide conveyors are systemized in the Giant Gravelmaster to handle big primary and secondary capacity.

More tons per hour — more profit! Each component of the big, new, powerful, portable Universal Giant Gravelmaster is engineered and built to deliver maximum capacity . . . the entire plant is systemized (each component carefully engineered to work together for peak efficiency) to give you more tons per hour, more profit from your operation. See your Universal distributor for complete facts.

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UNIVERSAL
In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING CORPORATION

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A subsidiary of Pettibone-Mulliken Corporation, 4700 W. Division St., Chicago 51, Illinois

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**WORK LONGER,
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WEAR LESS!**

Designed with rugged, one-piece alloy shells ... wide type, cast manganese steel cutting edges ... smooth shell interior for fast, capacity loads and easy discharge ... manganese bushings ... diagonal truss brace to keep shell in line ... has no side sway or back lash ... *plus many other cost-cutting design features!*

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START achieving maximum screening efficiency and continuous high tonnage production by installing proven HANCO SCREEN HEATERS which

STOP screen cloth blinding, costly shutdowns, screen damage and too-frequent replacement due to abusive mechanical screen-cleaning methods.

HANCO ENGINEERS will promptly analyze your requirements and make recommendations for more profitable screening of your products.

Hanco

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F. R. HANNON & SONS

1605 Waynesburg Rd. SE., Canton 7, Ohio

CABLE ADDRESS: HANCO

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(Continued from page 184)

Nuclear control program

WITH THE APPLICATION of nuclear energy to improve its industrial quality control program, Bucyrus-Erie Co., Milwaukee, Wisc., has taken the initiative in the excavating and drilling equipment industry. This firm employs radiographic methods, using isotopes of either radioactive cobalt 60 or iridium 192, to check for defects in castings and welds. To facilitate this scientific control method, the firm recently completed a 56 x 30-ft. reinforced concrete radiography building on the plant grounds. The structure is divided into three main rooms, with a maze or corridor separating the gamma work area from the development and viewing rooms.

The 20-ft. square gamma room is enclosed by 5-ft. thick walls, consisting of double sections of 12-in. thick concrete separated by 3 ft. of sand. The room also has a removable roof in case a casting is too large for the conventional entrance through the concrete maze. Operating under a special license from the Atomic Energy Commission, the company has installed a Multitron 52—a "safe" device which holds the radioactive cobalt and iridium pellets when not in operation. The Multitron weighs 1,090 lb.

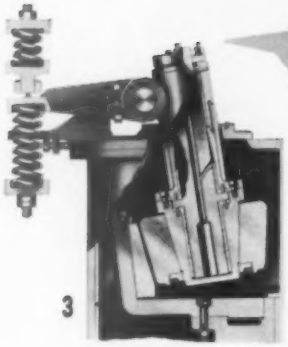
Bauer Co. formed

FORMATION OF THE BAUER Equipment & Supply Co., Chicago, Ill., was announced by Eugene C. Bauer, Jr. The new organization will be active in the field of sales and engineering of abrasion-resistant castings of manganese steel, alloy steels and Ni-Hard iron. Malleable iron, friction iron and carbon steel castings for general industrial use and a heavy-duty line of bucket elevators, drag conveyors and belt conveyors for the handling of bulk materials will also be offered. Mr. Bauer is a former chief executive officer of Kensington Steel Co. and executive vice president and director of Poor & Co.

(Continued on page 188)

RAYMOND BOWL MILLS

1



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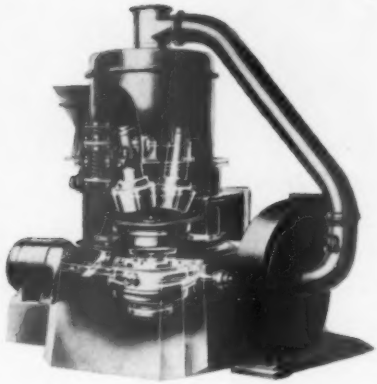

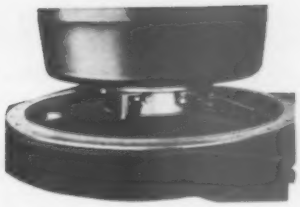

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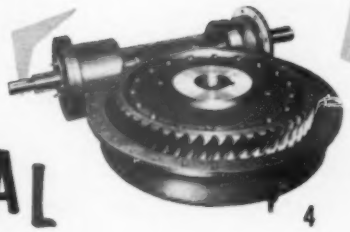
almost PERPETUAL MOTION...



4

THE CONTINUOUS, ROUND THE CLOCK, OPERATION OF RAYMOND BOWL MILLS BORDERS ON PERFECT AUTOMATION.

Capacities of over 18 million tons annually, with 390 units in use on kiln firing alone, is the record set by Raymond Bowl Mills in the handling of coal . . . any grade or moisture content.

Bowl Mills have high availability and wide range capacity.

Flexible control of a noiseless and dustless operation with low maintenance is assured.

Widespread application has been made on rotary kilns for Cement, Lime, Dolomite and other products. Kilns provide increased production, superior product quality, lesser fuel costs and maximum burning efficiency with overall operating economy.

These important parts are largely responsible for maintaining the constant, smooth, highly efficient performance of the Mill.

1. The Revolving Bowl directs the coal between the rolls and the grinding ring by centrifugal force, providing maximum grinding efficiency with minimum load of unground material.

2. Tramp Iron, Pyrite, Slate and other foreign materials are automatically and continuously removed from the mill through the Reject Spout.

3. The Journal Assembly has trunnion and spring pressure mechanism for adjustment of grinding pressure between roll and bull ring. The sliding saddle on top plate is adjustable from outside to align roll and compensate for any wear.

4. A precision built Worm Gear Drive that runs in a bath of oil, giving a smooth, quiet, vibrationless operation.

The Bowl Mill is a rigidly constructed, proven machine with a renowned record of performance, backed by an organization with over a half-century of experience in manufacturing pulverizing equipment.

Having a MILL under finger-tip control with day in and day out operation that approaches perfection is practically like having Perpetual Motion.

FOR DETAILS SEND FOR RAYMOND BOWL MILLS CATALOG 75 R

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For open gears, sliding surfaces—exclusive formulas eliminate metal to metal contact, keep wear on the lubricant not the metal—no breakdown even after prolonged use under water—available for every climatic condition—packaged in handy 16-oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

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• Hydraulic Units, Torque Converters • Roller, Ball, and Sleeve Bearings • Speed Reducers

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Ore Carriers Move It • FASTER • EASIER • AT LOWER COST

SCOOT-CRETE CD-4, shown being loaded in mine, will carry up to 15 tons payload. Model CD-3N has 5-ton payload. Note driver's side-mounted position for maximum vision and efficiency, forward and rear.

***Throughout the world,* SCOOT-CRETE gives top-rate performance. No rails needed, no ties, no cars, no independent power source. Diesel-powered for operation inside the mine, SCOOT-CRETE carriers are rugged for around-the-clock service; carry up to 15 tons at speeds to 15 mph, climb grades up to 18%. Available with standard or fully automatic transmission. SCOOT-CRETE has equal speeds forward and reverse for fast shuttle service.**

ALL CD MODELS APPROVED BY U. S. BUREAU OF MINES FOR UNDERGROUND MINING.

Units available from 3,000 lb. to 15-ton capacity. Write for specifications and literature. See your Dealer.

GETMAN BROTHERS SOUTH HAVEN, ZONE 8, MICHIGAN

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(Continued from page 186)

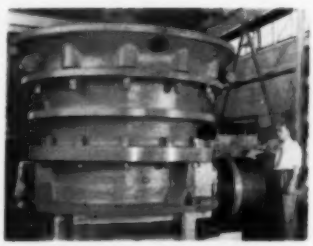
New cement bags

AT A RECENT CEMENT seminar sponsored by the West Virginia Pulp & Paper Co., New York, N.Y., Mr. Luke, manager of the company's bag division, announced that two new multiwall bags have been developed by the company for mortar and portland cement that can save the industry more than $1,000,000 a year.

"The million dollar savings to the industry," said Mr. Luke, "is based on using a lighter, tougher extensible paper . . . which is . . . suited for the shipment and storage of cement."

The company has also developed a new approach to palletizing cement bags that could effect further substantial savings to the industry.

South African crusher

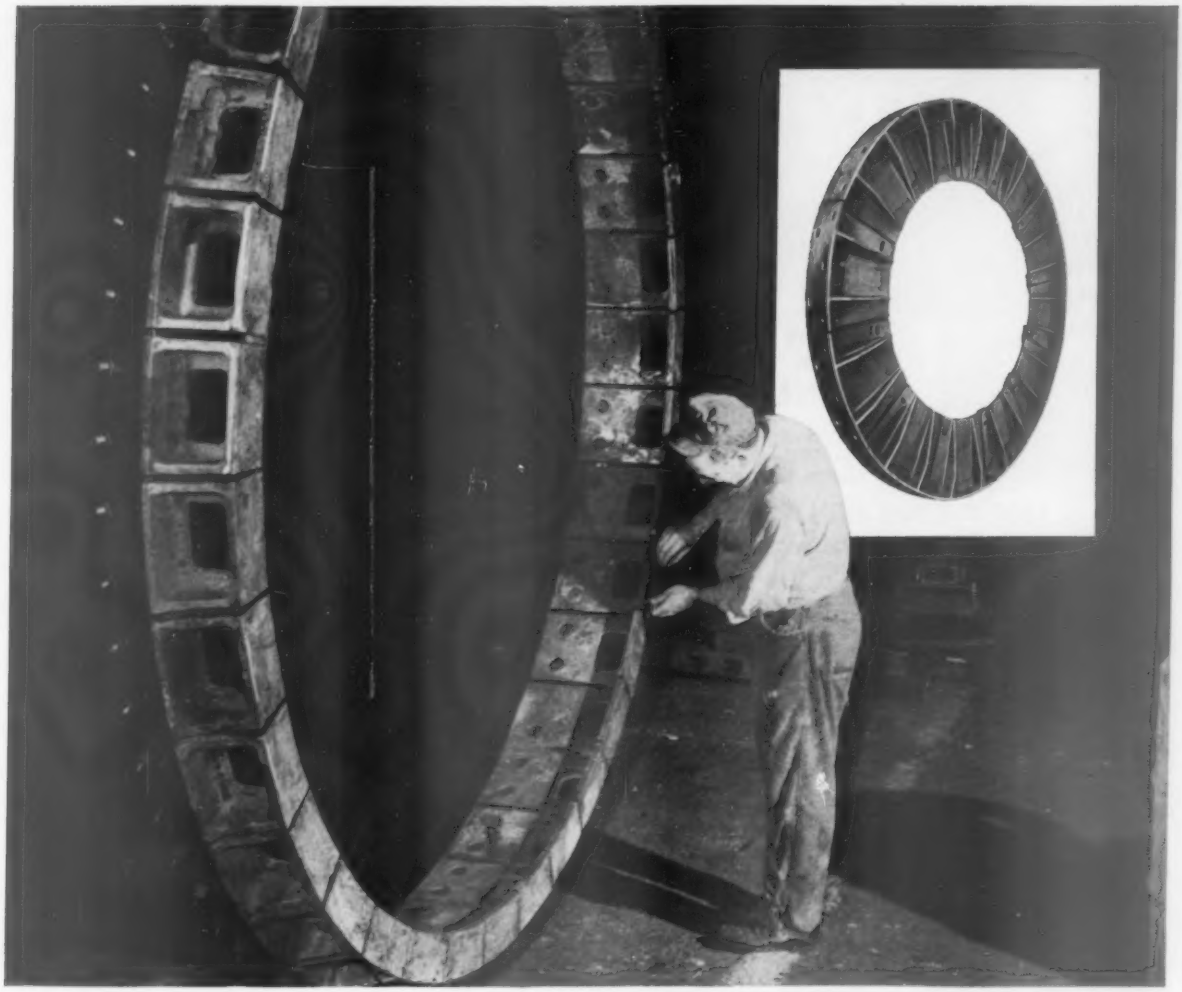


ONE OF THE LARGEST gyratory crushers ever to be manufactured in South Africa has just been completed and installed for the production of crushed stone for roads and building purposes. The crusher, manufactured in Johannesburg by Messrs. Samuel Osborn (S.A.) (Pty.) Ltd., weighs 113,000 lbs. and has a through-put of up to 400 tph. when operated at a 4-in. setting. A special feature of the machine is its low squat proportions in relation to its capacity.

Home study course

A HOME STUDY COURSE in business administration is being offered to management employes of Allis-Chalmers Mfg. Co., Milwaukee, Wisc. Marquette University is preparing 39 lessons on economic theory, corporations, personnel management, managerial tools and techniques, production and marketing. Each lesson will require 5 to 10 hr. of home study and self-administered reviews.

(Continued on page 190)



IN CEMENT, LIME, AND DOLOMITE PLANTS...

B&W Nose and Tail-Ring Castings Demonstrate Longer Continuous Service

Longer brick life and longer continuous service are being attained by 275 kilns in 54 plants using B&W Nose and Tail-Ring Castings. In many cases, the life of these castings has exceeded 9 years.

Light and strong B&W Alloy Castings have improved kiln performance in most installations. Made of heat-resisting Grade HH alloy, nose ring castings eliminate belling out of the kiln shell, assuring longer brick life and longer continuous operation of the kiln. By protecting the end of the kiln shell from direct flame, the nose ring castings prevent "feathering-down" of the shell because of oxidation. Their design eliminates cracking and warping, experienced with large size castings.

Small size and light weight make B&W Castings easy and inexpensive to install. The protecting flange on the nose ring castings permits the use of low-alloy steel bolts for fastening.

Spare part inventory may be kept low because the same nose ring castings may be used on kilns varying up to 4 feet in diameter, depending upon size. Write for Bulletin S-17. The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.

B&W

THE BABCOCK & WILCOX COMPANY

BOILER DIVISION

S-467

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MEMO

To PRODUCERS

Just checking . . . . have you noticed the advertisements which apply to your operation?

ROCK PRODUCTS Advertisers regularly keep you well informed concerning both new equipment and processes.

Why not glance through this issue again to make sure nothing of importance to your business has missed your attention.

(Continued from page 188)

Diesel walking dragline

CLAIMED TO BE the world's largest diesel walking dragline, this Model 732 was custom-built by the Page Engineering Co., Chicago, Ill. This machine is powered by twin V-6 diesel engines. It carries a 200-ft. boom and is swinging a 16-cu. yd. dragline bucket. This machine is said to introduce a completely new all-purpose, all-depth dragline bucket with controllable digging capacity.

Safety movie

"THE QUOTA" is a new 25-min. safety film produced by the Construction Machinery Div., Clark Equipment Co., Benton Harbor, Mich., in cooperation with the National Safety Council. Based on the hard facts of heavy construction life, the movie depicts many of the accidents that happen and shows why they happen. In every case, the vital preventative steps that should have been taken are presented. "The Quota" deals with both accident prevention and with cumulative and far-reaching effects of construction equipment accidents. The film is available on loan from the company.

International Harvester—50 years

INTERNATIONAL HARVESTER CO.'S Chicago, Ill., Tractor Works is celebrating its 50th anniversary of tractor production this year. Over the years product items have included crawler and wheel tractors, power units and bullgrader and bulldozer blades. The Tractor Works is now turning out four basic models of crawler tractors—ranging from 50 to 134 net engine hp., and matching units of hydraulic and cable-operated graders and dozers.

END

SYNTRON cost-cutting equipment of proven dependable Quality

for heavy tonnage conveying

SYNTRON Mechanical VIBRATING CONVEYORS

—multi-purpose units designed for high speed conveying of sand, gravel, stone and many other bulk materials in densities ranging from 5 to 400 pounds per cubic foot and in sizes from powder to large chunks.

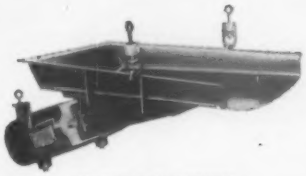
They can be fitted with screen sections to provide both conveying and screening.

Low initial cost — low power requirements — simple construction assures maximum performance with low maintenance.

SYNTRON Vibrating Conveyors are available in lengths and widths to meet most requirements.

Write for free informative Catalog today

Other SYNTRON Equipment of proven dependable Quality



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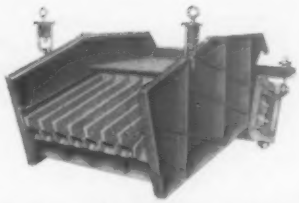
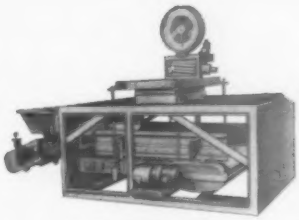
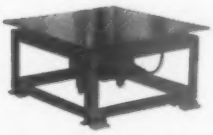


VIBRATING SCREENS AND GRIZZLIES



GRAVIMETRIC FEEDERS



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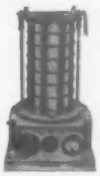
TEST SIEVE SHAKERS



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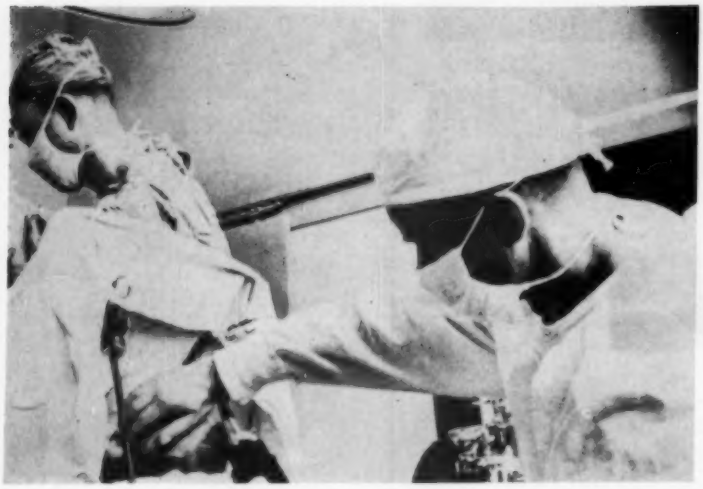

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You may find just what you're looking for in the used equipment, employment and professional advertisements below. Box numbers are confidential and advertisers' names will not be disclosed. Send replies to: Box Number (shown on ad), c/o ROCK PRODUCTS, 79 W. Monroe St., Chicago 3, Ill. All replies will be forwarded to advertisers daily.

LIQUIDATING

1—Allis Chalmers SS rotary dryer, 6' x 50', complete with drive, motor, fans and blowers.

2—Louisville SS rotary dryers, 8' x 50', complete with drives, motors, fans, blowers, etc.

1—Traylor 11' x 155' rotary kiln, 2 tires, welded ⅞" shell, complete with drive and motor

1—Louisville rotary steam tube dryer, 8' x 45'

1—Rotary dryer 7' x 60', 2 tires, ½" shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary 6' x 64', 2 tires, ½" shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary dryer 6' x 56', 2 tires, ½" shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary dryer 6' x 50', 2 tires, ½" shell, complete with drive, motor, blowers and all auxiliary equipment

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1—Steel ball mill 7½' x 7', complete with full charge of steel balls and drive

1—General American 7' x 40' rotary dryer, ⅜" welded shell, complete

1—Bartlett & Snow Lab. Calciner, 6" x 7'

10—Pacific vertical feed water reciprocating pumps, 10 GPM to 340 GPM, 80' head to 175' head, complete with motors

1—Dorr Type DSFR—2 classifier, 3' x 20'6" x 2½" slope

1—Hardinge pilot size ball mill, 24" x 8", complete

1—Patterson rod mill, 4' x 11'6"

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3—10' x 78' National dryers, ¾" shell

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2—8'8" x 70' Ruggles Coles dryers, ⅝" welded

2—8' x 60' Devenport dryers, $\frac{7}{16}$" welded.

1—7'6" x 62" kiln, ½" welded

1—7' x 70' Louisville cooler, ½" welded

1—7' x 60' Bonnet dryer, ⅞" shell

1—7' x 50' Allis-Chalmers dryer, ⅜"

1—6' x 50' Louisville steam-tube

1—6' x 7' x 100' kiln, ½" shell

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1—Hardinge 10' x 48" conical ball mill

1—Kennedy 7' x 9' contin. ball mill

2—Hardinge 7' x 36" conical pebble mills

2—Hardinge 6' x 48" conical ball mills, 75 HP

1—Allis-Chalmers 6' x 16' ball-tube
3—Allis-Chalmers 5' x 22' ball-tube

1—Allis-Chalmers 5' x 5' ball, 75 HP

1—Hardinge 4'6" x 16" conical ball

CRUSHERS—PULVERIZERS—MISC.

1—Raymond 50", 5-roller hi-side mill

1—Raymond 66", 6-roller lo-side mill

6—Jaw Crushers: 36" x 15", 24" x 13", 20" x 6", 18" x 9", 8" x 10"

1—B.&W. #E-32 pulv., 75 HP

3—Steel bucket elevators, rubber belts, up to 50' high, steel casing.

1—24" trough belt conv., 538' long

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COMPLETE LIGHTWEIGHT AGGREGATE PLANT SINTERING PROCESS EQUIPMENT

Can be moved to new location and placed in operation at fraction of cost of new plant. Includes everything removable such as 66' sintering machine, electrical equipment, conveyors, crushers, screens, etc.

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Marietta, Ohio

FOR SALE

No. 25½ Kennedy Van Saun gearless gyratory crusher. Serial No. 1535. Complete with 40 HP motor and starter. Excellent condition.

3-Roll Crusher, Pioneer 40x22 Serial 403-10. Complete with 125 HP motor and controls. Excellent condition.

*(Both crushers were completely overhauled in January 1960 and may be seen in operation until Sept. 1, 1960).

Bucyrus Erie 22 T Blast Hole Drill, crawler mounted with tools and spare parts. Good condition.

Hough Payloader, Model HF, ¾ yd. Hydraulic bucket. Fair condition.

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Bluffton, Indiana

Phone 18

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continued . . .

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Cedarapids 2236 Primary Jaw Crushing plant.
Cedarapids Jr. tandem crushing plant, 1636 jaw.
Cedarapids Portable Screening Unit.
Cedarapids 1216 Twin Jaw Crusher. Reconditioned.
Cedarapids 3033 Hammermill. Remanufactured.
Cedarapids 2633 Hammermill. Rebuilt.
Cedarapids 16" open inclined bucket elevator.
Cedarapids 4' x 14' 2-deck screen.
Cedarapids 4'x12', 2-deck screen
Telsmith 3' x 8', 3-deck inclined screen.
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54" dia. x 23' lg. revolving screen.
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8' x 13', 8' x 18', 13' x 23' bins in stock
18", 24", 30", 36" conveyors & belting
Smithco 30"x34', 7½ H.P. Belt Conveyor.
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Lorain MC-414, 20-ton Moto-Crane.
Link Belt HC-90, 25-ton truck crane.
Michigan TLDT-20, 10-ton truck crane.
Lorain MC-254, 15-ton Moto-crane.
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2—Euclid 13-yd. bottom dumps. Good.
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1—Caterpillar D-6 with Hydraulic Angledozer
1—Caterpillar D-6 with cable angle dozer.
1—Caterpillar HT-4, 1¼-yd. Traxcavator.
1—Caterpillar D-4 tractor only.
2—Euclid TC-12, twin engine tractors
1—International TD-24 with cable angledozer.
1—Letourneau Super C Tournadozer. Excellent.
3—Letourneau CR, 12-yd. Tournapulls.
1—Allis-Chalmers HD-15 with Cable Bulldozer.
1—Allis-Chalmers HD-9-G Tractor with loader.
6—International 2TT5, 15-yd. scrapers.
2—Allis Chalmers TS-360, 15-yd. scrapers.
2—Euclid TS-24, 24-yd. twin engine scrapers
1—Euclid 15½-yd. six wheel scraper.
3—Euclid 7-yd. overhung engine scrapers

Inquire for list of drilling equipment, air compressors, diesel power units, generators, shovel & backhoe attachments.

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Complete pulverizer plant including circular bin, Hardinge 6' x 36" conical ball mill, Hardinge air classifier, sand feeders and conveyors.

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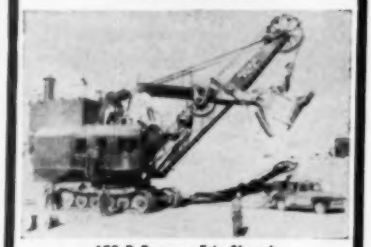

170 B Bucyrus Erie Shovel

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3—6" x 43' Carpco, BC-68, sliding belt.
2—6" x 33' Carpco, BC-68, sliding belt.
1—60" x 150', steel framework, 100 HP. gearmotor
1—42" x 1250', Link Belt, 2—100 HP. gearmotors
1—36" x 645' Link Belt, 100 HP. gearmotor
1—42" x 870' Link Belt Trailing Type and Conveyco mobile stacker, 100 HP. gearmotor 440 V.

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1—10 x 20 Rogers Iron Works, with drive
1—10 x 21 Telsmith wit motor & drive
1—10 x 30 Pacific, Type KH, motor & drive
1—2½" x 4" Braun chipmunk, 2 HP. 220/440 V
2—2¼" x 3 Braun chipmunk, ¾ HP. Motor
1—15" x 36" Universal, 50 HP. 220/440 V.

CRUSHING PLANTS

1—10" x 36" Pioneer Model 40 V, UD 24 Diesel Power.
1—15" x 24" Cedar Rapids Portable, Case Gas Power
1—10" x 16" Cedar Rapids Pitmaster, Complete UD 14 Diesel

HOPPER

Conveyco truck dump station, Hopper 15' x 15' x 10' with tilting Grizzly, 4' x 8' plate feeder, all complete with Hydraulic cylinders, gearmotor drives.

KILN

1—48" x 30' Hardinge Ruggles Cole, Complete Excellent. Located Clearwater, South Carolina

MILLS, BALL & ROD

1—3' x 8' Hendy Rod Mill, 30 HP. 440 V.
1—5' x 10' Marcy Ball Mill, 100 HP. 440 V.
5—8' x 9' Traylor Ball Mills

SCREEN

1—9' dia. x 54½' Yuba Trommel, 100 HP. West. 440 V.
3—4' x 12' Tyler Ty-Rock, F-600, 10 HP. 220/440 V.
1—4' x 8' Symons Rod Deck Screen, 7½ HP. 220/440 V.
1—4' x 10' Tyler Hummer, Type 38
2—6' x 12' Allis Chalmers lowhead, 10 HP. 220/440 V.

SHOVELS

1—Model 111 M Marion shovel & Dragline, Diesel Electric 4 yd., 100' Dragline Boom
1—Model 170 B Bucyrus Erie Electric shovel Essco Bucket, 2400/4160 Y, Rotoclone Air Filter system, Complete with rubber cable, and Junction Box.
1—Model 7200 Marion walking dragline, diesel-electric
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7400 Marion Diesel Drag, 175', 13 yd.
71-B B.E. Crane with 160' boom
625 Page Diesel Drag, 150', 10 yd.
1855 P&H Diesel Drag, 130', 10 yd.
621-S Page Diesel Drag, 125', 7 yd.
200-W B.E. Diesel Drag, 125', 6 yd.
2400 Lima Elec. Drag, 130', 6 yd.
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4500 Manitowoc 5 yd. H.L. Shovel
1055 P&H 3 yd. H.L. Shovel
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111-M Marion Standard & H.L. Shovels
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Farrel Lab. Jaw Crusher 6" x 2"
Denver Lab. Jaw Crusher 3¼" x 4½"
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Acme Jaw Crusher 14x26, Steel Frame.
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Head & Tail Assembly 42" Conveyor, Roller Bearing, Almost New.
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22" Magnetic Pulleys
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500' 9" Screw Conveyor Complete With Ends, Hangers, Gearmotors.
14" and 16" Used Rex Idlers
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30" to 48" Used Robins Idlers
Two Dust Elevators 5" Buckets
Heatherington Dryer 6' x 32' 50 H.P.
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Niagara 4' x 14' Single Deck Screen
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New Universal Screens in Stock.

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8" Jr. I Beam Frame Conveyors

Truss Frame Conveyors

Built Like A Bridge For High Tonnages Clear Spans to 50 Ft.— Any Length—Any Belt Width

Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2¼" or 2 7/16" diameter shaft.

We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. **WRITE FOR BULLETIN #1138.**

Bonded troughing idler conveyors also available in Truss Frame Construction. **WRITE FOR BULLETIN #1189 AND PRICES.**

JR. I BEAM CONVEYOR PRICES

Conveyor Prices Include Belting

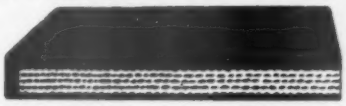
Belt Width	Conveyor Length	List Price	Sale Price	Add or Deduct Per Foot
14"	25'	$1425	$ 766	
14"	50'	2266	1181	$16.62
14"	85'	3445	1763	
16"	20'	1287	780	
16"	45'	2180	1128	
16"	60'	2715	1384	17.10
16"	90'	3786	1897	
16"	150'	5928	2923	
18"	25'	1507	830	
18"	45'	2261	1190	
18"	70'	3205	1641	
18"	85'	3771	1912	18.03
18"	100'	4337	2182	
18"	130'	5469	2723	
18"	200'	8111	3985	
20"	25'	1547	871	
20"	60'	2940	1546	
20"	75'	3536	1836	19.30
20"	90'	4133	2125	
24"	25'	1622	922	
24"	45'	2479	1335	
24"	70'	3550	1852	
24"	100'	4835	2473	20.68
24"	120'	5692	2886	
24"	150'	6977	3507	
24"	200'	9119	4540	
30"	50'	2969	1591	
30"	70'	3948	2054	
30"	90'	4928	2518	23.17
30"	140'	7376	3676	
36"	25'	1854	1105	
36"	45'	2915	1623	
36"	60'	3711	2012	25.91
36"	100'	5832	3048	

Other lengths and belt widths priced upon application. **BONDED 30" DEEP TRUSS CONVEYORS** also in heavy duty Portable Models. Available with Screen and Feeder and with mast or mastless type undercarriage and hydraulic powered mechanism. Lengths to 60 feet and belt widths through 30 inches. Equipped with Tow Hitch for easy moving from one job-site to another.

PRICED FROM $2365.

TESTED CONVEYOR BELTING*

WE PAY FREIGHT ON 200 POUNDS OR OVER PLUS AN ADDITIONAL 10% SAVINGS FROM SALE PRICE FOR FULL ROLLS 500 TO 650 FEET.



MAJOR BRAND: 12# to 15# Friction Pull. 800# to 1000# Cover Tensile. **Heavy Duty.** 28 oz. duck. ⅛" top x 1/32" bottom rubber covers. Tough cotton duck, strong carcass and proper flexibility. Used in moving boxes, bags, coal, sand, gravel, crushed stone, salt, earth and similar materials.

Width	Ply	Domestic Belt Per Foot
14"	4	$2.54
16"	4	2.89
18"	4	3.42
20"	4	3.95
24"	4	4.43
30"	4	5.42
36"	4	6.43

MAJOR C-BEE BRAND: Smooth Surface. 15# to 17# Friction Pull. 1600# to 2300# Cover Tensile. 28 oz. duck 4 Ply, Skim coat between plies. Heavy Duty belt for severe service and abrasion resistance.

Width	Top Cover	Bottom Cover	Imported Belt Per Foot
14"	1/16"	1/32"	$2.96
16"	1/16"	1/32"	3.12
18"	1/16"	1/32"	3.44
20"	1/16"	1/32"	3.97
24"	1/16"	1/32"	4.46
30"	1/16"	1/32"	5.56
36"	1/16"	1/32"	6.45

THE FOLLOWING BELTS ARE 5 PLY, 32 OZ. DUCK:

24"	1/16"	1/32"	$4.53
30"	1/16"	1/32"	5.69
36"	1/16"	1/32"	7.18

MAJOR BEE BRAND: 16# to 19# Friction Pull. 2400# to 3000# Cover Tensile. Skim Coat Between Plies. A high grade of heavy duty, 28 oz. duck with 1/16" top x 1/32" bottom rubber covers. For severe service and abrasion resistance. For stone, mineral ores, concrete, cement and coal.

Width	Ply	U. S. Made Per Foot	Imported Belt Per Foot
16"	4	3.60	3.14
18"	4	3.98	3.47
20"	4	4.54	3.99
24"	4	5.14	4.50
30"	4	6.31	5.58
24"	5	5.10	4.73

MAJOR B-X SMOOTH SURFACE: 20# to 24# Friction Pull. 3400# to 4000# Cover Tensile. A heavier duty belt with 1/16" top x 1/32" bottom covers. For higher abrasion resistance and handling of materials where more strength is required.

Width	Ply	U. S. Made Per Foot	Imported Belt Per Foot
16"	4	$3.93	$3.31
20"	4	4.98	4.02
30"	4	6.92	5.50

*** All belting is tested by the Engineering laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.**

Other widths, plies, duck weights and cover thickness available at low prices.

WRITE FOR FREE SAMPLE & BULL. #1262

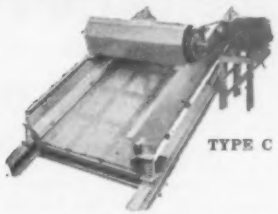
SCALE TEST WEIGHTS

50# Steel Test Weights with steel T Handle, $11.00 each.

BONDED* VIBRATING SCREENS

PROMPT SHIPMENT OF ALL MODELS

SPECIAL SERVICE SCREENS



TYPE C

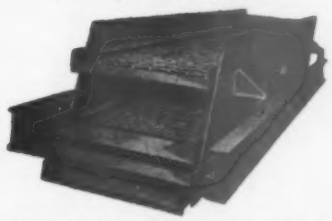
WRITE FOR BULLETIN #1224

For scalping middle-range pieces and accurate sizing of fines where quantity and feed do not warrant a larger capacity, heavy duty model. Medium to heavy construction. Can also be suspended from four steel cables and springs for portable or temporary installation. Vibration remains in working screen body. No shaking of tipple, building or platform.

Priced from $487

WRITE FOR "SEVEN SECRETS OF SUCCESSFUL SCREENING" IN BULL. 1086

HEAVY DUTY SCREENS

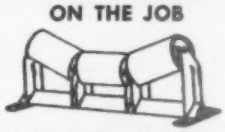


FACTORY BALANCED, CONTROLLED VIBRATION. Four bearing positive throw eccentric shaft: 3' x 6' to 5' x 14'. 1 to 5 decks. **"9 REASONS WHY BONDED IS YOUR BEST BUY."**

For high tonnages, heavy scalping and multiple sizing of such minerals and industrial products as handled by above models. No dead spots. Springless live-rubber mounting of screen body controls vibration. Screen cloth and plate in all models reversible for longer life. Their finished edges prevent plates from splitting and cloth from ravelling.

Priced from $1620

BONDED® IDLERS & RETURN ROLLS FOR UTMOST ECONOMY ON THE JOB



3-roll, 5" diameter Troughing Idlers for:

14" belt	$19.75	24" belt	$22.75
16" belt	20.50	30" belt	23.85
18" belt	21.90	36" belt	24.90
20" belt	22.10	48" belt	27.50

1-roll, 5" diameter Return Rolls for:

14" belt	$ 8.50	24" belt	$11.00
16" belt	9.00	30" belt	12.50
18" belt	9.50	36" belt	13.75
20" belt	10.00	48" belt	16.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable prelubricated sealed ball bearings. Maintenance is negligible. **WRITE FOR BULLETIN #1138.**

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6—Vulcan 6'6"x60'x½" Rotary Kilns
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2—Beth. Fdy. 7'x24' Compeb Mills
2—Allis-Chalmers 6K; 8K Gyratorys
1—Barber Greene Model 82A Loader

STOCK ITEMS

8'x60'x½" welded Rotary Kiln
6'x120'x½" Vulcan Rotary Kiln
4'x30' Bonnot Rotary Dryer
3'x3'x12' Horiz; 4'x9'x12' Vert. Puggers
Komarek-Greaves 27"x24" Briquet Presses
6'x25'; 6'x50' Louisville Rotary Dryers
7'x50'; 8'8"x70' Ruggles-Coles Dryers
Dixie #5060 Mogul Hammermill
15"x8" to 24"x18" Jeffrey Hammermills
Raymond 5 Roll #5057 Hi-Side Mill
Raymond 3 Roll #3036 Hi-Side Mill
Raymond #50, #40 Impact Mills
Jaw Crushers 48"x60", 36"x48", 20"x6"
4—Robinson Saw Tooth Crushers
535'—24" Troughing Belt Conveyor
Bucket Elevators 45° to 90° Centers

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Mixermobile Model M-7, tower 49', 2 yd Mixer
Howe scale No. 82 exact weight indicator

MILLS—CRUSHERS—KILNS—DRYERS

JAW: Reliance, 14x24, Buchanan 18x36, 24x42, Type C 30x42, Cedar Rapids 2036, Traylor 28x36, 36x48, 56x72, Lippman 24x36; Universal 30x42; Superior McCully 42x40.
GYRATORY: Al. Chal. 8, 5K, 10", 16, Gates 12K; Traylor TZ Kennedy Van Saun 37½.
CONE: Symons 3', 4¼', 5½', Kue-Ken 36"; Traylor TX4; Telsmith 3'.
ROLL: Cedar Rapids 24x16, 55x30; Al. Chal. 27x16, 42x16, Pioneer 40x22, 48x24 triple, 54x24; Telsmith 40x22; Universal 30x18; Lippman 40x30.
MILLS—ROD—Denver 4x8, 4x10; Hardinge 4x10; Marcy 3x8, 5x12.
TUBE: Al. Chal. 4x22, Smidth 5½x20, 6'6"x21; Hardinge 4½x16" 8x16"; 8x9"; 8x36; 8x48; 10x48.
HAMMERMILLS: Penn 8XT-350 HP motor, 6XR 10'x4'7"; Stedman 24x30, 36x42; Cedar Rapids 50-50, 2033, 30x33, 30x42 double; Dixie 36x30.
AUTOCLAVES: J&C 6'6"x58" Quick Acting.
KILNS: 6'x50', 6'x120', 9'x100', 8x124'.
DRYERS: 6'x40, 6x60, 6x72.
BALL MILLS: 4½'x16", 8'x36", 8'x48"

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Pioneer 10"x16" Crush. Plant with Pioneer 303-W Washing-Screening Plant
Eagle log washers Model BMD 48"x30'; BMD 4322 7'x21' Twin, 36"x20' dbl. log washer, 36"x30' Pioneer Port. 10x24 jaw, 24x16 roll. Complete C-B Prim. Port 22x36. Diesel.
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Johnson 150 ton 3 compt. aggr. cement silo. 1500 bbls. Complete.
Johnson 400 yd 6 compt. aggr. large capacity.
Johnson automatic batch, 10,000 bbl. cement
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Cook Bros. Model BDSI bulk cement semi-trailers
Erie Strayer 120 tons aggr. bin, 880 bbls. cement
Erie Strayer, new 1955, 49 yds per hour.
Blaw-Knox 400 bbls HI and 400 bbls LO cement bins and aggregate 5 compart. bin. Complete
Smith 84-8 2 yd Tilt. Mixer 40 HP AC motor

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Morris 6" Diesel on 14'x36' hull
Ellicott 14" x 12" Steel Hull 64' x 32' Diesel.
10" Portable Diesel powered. Complete.
Amsco 12" suc. 10" Dis. Hull 26'x50' Diesel-Elec.
Ellicott 8" with cutter. Diesel Hull 48'x18'x3'6"
6" Hydraulic Diesel. On 32'x8' steel pontoons
6" portable Diesel complete with cutters, etc.

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Tyler-Hummer 4'x10' one Deck
New Symons 3'x12' 5 HP Elec. Motor.
Simplicity 5'x14' double deck
Cedar Rapids 4'x12' dbl. deck 25 H.P. elec. motor
Pioneer 5'x12' 2 deck 20 H.P. elec. motor
C-B 4'x14' 2 deck 25 HP motor

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2—Allis Ch. 7'6" x 7' x 125' Rotary Kilns.
1—Traylor 8' x 80', ⅝" shell.
1—Vulcan 8' x 80', ½" shell.
1—Vulcan 7' x 80', ½" shell.
2—Link Belt Roto Louvre Dryers, 6'4"x24'.
1—Rennenberg 6' x 50', ⅜" shell.
1—Ruggles Cole 5' x 30', ⅜" shell.
1—Allis Chalmers 4' x 40'.
1—Allis Chalmers 4' x 30', ⅜" shell.
1—34" x 30', $\frac{5}{16}$" shell.

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Two—Model RD-1520, 16 cu. yd. cable operated. Used only 4 months. Excellent rubber. Excellent operating condition. Sheave rock guards & cable savers. Will fit Caterpillar DW 15 or late DW 10.
ONLY $3,000. each F.O.B. Des Moines

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Pilot model RW 21 rock wagon—17 cu. yd. struck. For use with Caterpillar DW 21 tractor. 24:00x29/36 ply tires. Hydraulic rear dump. Built with many Cat. parts (hyd. system, wheels, etc.).
ONLY $2,000. F.O.B. Des Moines

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MARION WALKING DRAGLINE, 5 YD.

1—Type 7200, Serial No. 8839, diesel engine driven. 50 H.P. G.E. motor, 230 V. DC boom hoist with 20 H.P. G.E. Motor, 230 V. 45 KW G.E. DC generator driven by Model NHB5, 6-cylinder Cummins engine.

MARION DRAGLINE, 4 YD.

1—Model 111-M Marion Diesel Electric, year 1947. Powered by twin GMC diesel engines. 100 ft. Dragline boom. 3½ cu. yd. Essco dragline bucket; 4 cu. yd. Marion shovel front attachment.

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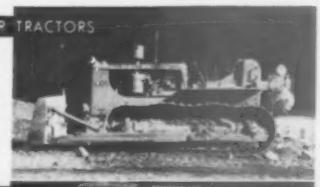

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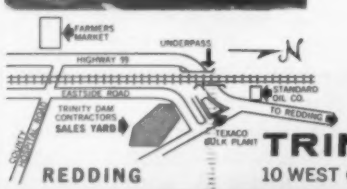

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Sand & Gravel Washing Plant, all electric. North of Milwaukee. Local Towns and area around 12,000 population. Complete with 27 acres sand and gravel deposit, and located on two Highways. Going full capacity. Complete with crushers, shovel, dragline, dozer, loaders, trucks, stock piles and Contracts. Write S-46, Rock Products, 79 W. Monroe, Chicago 3, Ill.

READY MIX CONCRETE PLANT FOR SALE

$500,000.00 ANNUAL GROSS AND STILL GROWING

LOCATED IN LAKE COUNTY, INDIANA

OWNER SEEKS RETIREMENT

WRITE FOR AN APPOINTMENT

Box R-58 c/o
Rock Products, 79 W. Monroe
Chicago 3, Illinois

GRAVEL PIT FOR SALE
100 Acres of tested and approved material located in Southern Ontario. May be purchased with or without new crushing & washing plant. Box S-34
ROCK PRODUCTS
79 W. Monroe St., Chicago 3, Ill.

FOR SALE
Sand and Gravel Plant
Established Business in Northwestern Ohio—Good Market Area—Large Sand Deposit—All Necessary Equipment. Write Box S-43, c/o Rock Products, 79 West Monroe St., Chicago 3, Ill.

EQUIPMENT WANTED

WANTED
CEMENT COOLER
SMIDTH OR FULLER
DRY PULVERIZED
MATERIAL COOLER
125 bbls per hour or
25 tons per hour
Can Use More Than One Unit
P.O. BOX 196
Plymouth Meeting, Pa.

Try A Small Ad
For Quick Results

RP BUYER RESEARCH SERVICE

PRODUCER PURCHASING SERVICE *FREE*

QUICK—COMPLETE SOURCE CONTACTS FOR ROCK PRODUCTS PRODUCERS
on Machinery—Equipment—Supplies—Service

___Aftercoolers, Air
___Agitators
___Aggregates (special)
___Air Compressors
___Asphalt Mixing Plants
___Bagging Machines
___Bags
___Barges
___Belting, Conveyor Elevator, Power Transmission
___Belting, V-type
___Belt Repair Equipment
___Bin Level Indicators
___Bins and Batching Equipment
___Bits
___Blasting Supplies
___Bodies, Trailer
___Buckets
___Bulldozers
___Cars, Industrial
___Classifiers
___Clutches
___Coal Pulverizing Equipment
___Concentrating Tables
___Conveyors
___Crushers
___Coolers
___Cranes
___Derricks
___Dewatering Equipment, Sand
___Diesel Engines
___Dragline Cableway Excavators
___Draglines
___Dredge Pumps
___Drilling Accessories
___Drills
___Dryers
___Dump Bodies
___Dust Collecting Equipment & Supplies
___Electric Motors
___Engineering Service Consulting and Designing
___Explosives & Dynamite
___Fans and Blowers
___Feeders
___Fifth Wheel Heavy Duty Special
___Flotation Equipment
___Front End Loaders
___Gasoline Engines
___Gear Reducers
___Generator Sets
___Grinding Media
___Gypsum Plant Machinery
___Hard Surfacing Materials
___Hoists
___Hoppers
___Kilns: Rotary, Shaft, Vertical
___Locomotives
___Lubricants
___Magnetic Separators
___Mills
___Pipe
___Pumps
___Scales
___Screen Cloth
___Screens
___Scrubbers: Crushed Stone, Gravel
___Shovels, Power
___Speed Reducers
___Tanks, Storage
___Tires and Tubes
___Torque Convertors
___Tractor Shovels
___Tractors
___Trailer Dump Bodies
___Trucks, Bulk Cement
___Trucks, Industrial
___Trucks, Mixer Body
___Trucks, Motor
___Valves
___Vibrators
___Welding and Cutting Equipment
___Winches
___Wire Cloth
___Wire Rope

If equipment you are in market for is not listed above, write it in space below.

_____

_____

The principal rock product(s) manufactured by my company is/are indicated "1", "2", "3", in order of importance below.

___Crushed Stone
___Sand & Gravel
___Slag
___Cement
___Lime
___Gypsum
___Ready Mix Concrete
___Concrete Products
Type_____
Other nonmetallic mineral (What?)_____

All above information is strictly confidential to be used to guide the manufacturers in supplying proper information.

Please Check Service Desired

☐ Have Salesman Call ☐ Literature only
☐ Prices ☐ By mail ☐ Urgent

NOTE: See—Where to Buy-Classified Advertising Section for used equipment and complete plant information

Name _____
Title _____
Firm _____
Street & No. _____
City and State _____
Your Signature _____ Title_____

FILL IN—TEAR OUT—MAIL NOW! *BUYER RESEARCH SERVICE DEPARTMENT:* **ROCK PRODUCTS** **79 W. Monroe St. Chicago 3, Illinois**

WANTED
COMPLETE NON-OPERATING BLOCK PLANT
MACHINERY ONLY
Box S-44, Rock Products
79 W. Monroe, Chicago 3, Illinois

WANT TO BUY
Rotary Kilns, Dryers & Coolers
Ball, Rod & Tube Mills
Roll, Cone, Jaw & Gyratory Crushers
Compressors, Locomotives, Derricks & Cranes
THE DARIEN CORP.
60 E. 42nd St., N.Y. 17, N.Y.

WANTED HELP — POSITIONS

POSITION WANTED
Have had over 25 years experience in cement plants with small and large kilns manufacturing all types of portland cement. Former experience includes various supervisory positions including Plant Manager. Geographical location or salary not too important. S-39, Rock Products, 79 W. Monroe, Chicago 3, Ill.

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Consulting Engineers
Automation—Materials Handling
Plant & Process Design
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Minerals Clays Limestone
Foundation Testing
Buildings Highways
THOMASVILLE DRILLING & TESTING CO., INC.
Thomasville, Pennsylvania.

JOHN R. RAND INCORPORATED
Geologic Consulting
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CONSULTING ENGINEERS,
SPECIALISTS IN LIME & GYPSUM DESIGN AND OPERATING PROBLEMS
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Crushing Plants
Cement Plants
Storage Methods
Operating Costs

E. LEE HEIDENREICH JR.
CONSULTING ENGINEERS
75 Second Street
Newburgh, N.Y.
Phone JO 1-1828 (Code 914)

Operation
Plant Layout
Design
Appraisals
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How to place your classified ad!

To place classified advertising in succeeding issues of ROCK PRODUCTS, simply complete coupon, attach copy, and mail to:

ROCK PRODUCTS, "Where to Buy" Department
79 West Monroe St., Chicago 3, Illinois

Company _____

Street _____

City _____ Zone____ State_____

Your Name _____

Check One: ☐ Remittance enclosed ☐ Please invoice me

Specify date of insertion:*

☐ January	☐ May	☐ September
☐ February	☐ June	☐ October
☐ March	☐ July	☐ November
☐ April	☐ August	☐ December

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"FOR PRECISION DRILLING, NO LOST HOLES, WE RELY ON TIMKEN® CARBIDE INSERT BITS"

Special report from Rock of Ages

LOCATION: BARRE, VT.

Operating conditions: dimensional granite quarry

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You get greatest economy in hard, abrasive ground with the Timken carbide insert bit. In softer ground, use the Timken all steel multi-use bit. They're interchangeable in the same thread series; you can switch bits when the ground changes. Bit bodies are made of Timken electric furnace fine alloy steel. Let us help you select the right Timken bit for your job. The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

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removable rock bits

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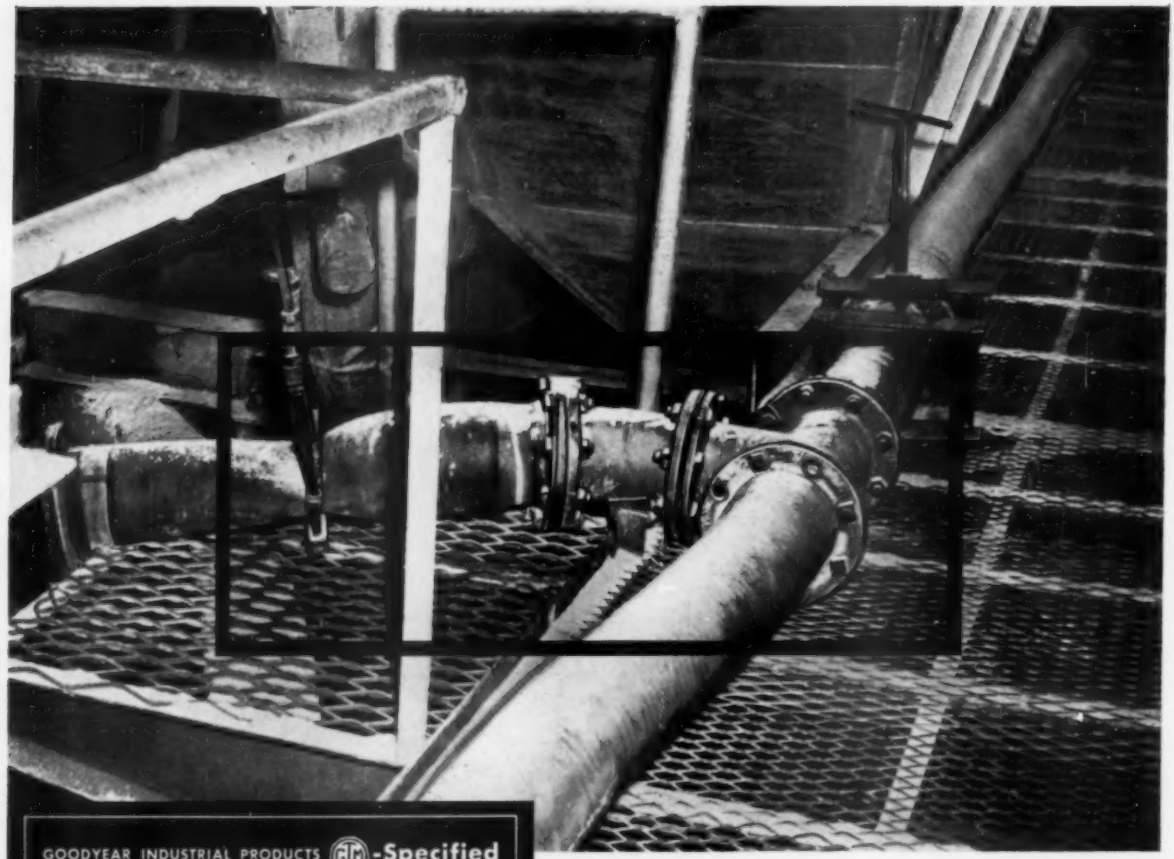

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